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Statistics Canada
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The Size of the Underground Economy in Canada

Studies in National Accounting
ISSN 1192-0106

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The System of National Accounts

In Canada, the National Accounts have been developed since the close of the Second World War in a series of publications relating to their constituent parts. These have now reached a stage of evolution where they can be termed a "System of National Accounts". For purposes of identification, all publications (containing tables of statistics, descriptions of conceptual frameworks and descriptions of sources and methods) which make up this System carry the term "System of National Accounts" as a general title.

The System of National Accounts in Canada consists of several parts. The annual and quarterly Income and Expenditure Accounts (included with Catalogue Nos. carrying the prefix 13) were, historically speaking, the first set of statistics to be referred to with the title "National Accounts" (National Accounts, Income and Expenditure). The Balance of International Payments data (Catalogue Nos. with prefix 67) are also part of the System of National Accounts and they, in fact, pre-date the Income and Expenditure Accounts.

Greatly expanded structural detail on industries and on goods and services is portrayed in the Input-Output Tables of the System (Catalogue Nos. with prefix 15). The Catalogue Nos. carrying the prefix 15 also provide measures of the contribution of each industry to total Gross Domestic Product at factor cost as well as Productivity Measures.

Both the Input-Output tables and the estimates of Gross Domestic Product by Industry use the establishment as the primary unit of industrial production. Measures of financial transactions are provided by the Financial Flow Accounts (Catalogue Nos. with prefix 13). Types of lenders and financial instruments are the primary detail in these statistics and the legal entity is the main unit of classification of transactors. Balance sheets of outstanding assets and liabilities are published annually.

The System of National Accounts provides an overall conceptually integrated framework in which the various parts can be considered as interrelated sub-systems. At present, direct comparisons amongst those parts which use the establishment as the basic unit and those which use the legal entity can be carried out only at highly aggregated levels of data. However, Statistics Canada is continuing research on enterprise company establishment relationships; it may eventually be feasible to reclassify the data which are on one basis (say the establishment basis) to correspond to the units employed on another (the company or the enterprise basis).

In its broad outline, the Canadian System of National Accounts bears a close relationship to the international standard as described in the United Nations publication: A System of National Accounts (Studies in Methods, Series F, No. 2 Rev. 3, Statistical Office, Department of Economic and Social Affairs, United Nations, New York, 1968).

The Size of the Underground Economy in Canada

by Gylliane Gervais *

Introduction

The size and growth of the 'underground economy' have kindled a lot of interest in Canada in the past few years, especially since the introduction of the Goods and Services Tax (GST) in January 1991. Hardly a week goes by without the media quoting someone claiming that underground transactions amount to 10%, 15% or even 20% of Gross Domestic Product (GDP), or that the deficit could be eliminated if the taxes were collected on these transactions.

If the figures often quoted about underground transactions are even approximately accurate, then the level and possibly the growth of Canada's GDP are considerably underestimated, to the extent that the information given policy makers about current economic conditions is misleading. Our statistical system, at least insofar as economic statistics are concerned, would be sorely inadequate if it failed to detect 'hidden' transactions of such magnitude.

Statistics Canada has the responsibility to estimate GDP. It has no interest in ignoring underground transactions or in minimizing the difficulties they entail for assessing the performance of the economy. The objective is, and always has been to come up with the best estimates possible. This is why as a matter of policy national accounts aggregates go through several revisions and are never really 'final'.¹ This revision process is in itself an acknowledgement that national accounts estimates are not perfectly accurate, and that measurement problems are numerous. Underground transactions are only one of them, albeit perhaps the most difficult to deal with.

Statisticians deal with numbers. In the case of the 'underground economy', these are hard to come by. For this reason, Statistics Canada may never be able to estimate precisely how much underground transactions represent as a proportion of GDP. However, what *can* be ascertained is whether or not particular transactions are captured in GDP, and if any are missing, how much they can possibly amount to. This is essentially the purpose of this study.

The paper is organized as follows. A first section defines the underground economy and draws a fundamental distinction between 'unmeasured' and 'unreported' transactions, and explains how transactions could be missed in GDP. The second section estimates the upper limit of underground transactions potentially missing from expenditure-based GDP in 1992, or in other words, of underground production escaping measurement. The third section extends the analysis to the underground economy in its totality by estimating, also as an upper limit, the underground production already captured in GDP and examines the evidence pointing to an increase in underground economic activity in recent years. Finally, the last section deals more generally with the issue of the size of the underground economy and whether the resulting underestimation of the level of GDP also leads to an underestimation of its growth rate.

1. Historical revisions are carried out every ten to twelve years in the national accounts and on such occasions, all the estimates are subject to revision back to the inception of the accounts. Estimates which have gone through four annual revisions are commonly referred to as 'final', but only in the sense that they incorporate all information expected to be available.

* The author wishes to acknowledge advice and assistance from Marie Allard-Saulnier, Katharine Kemp, Deborah MacDonald, Mitzi Ross, Philip Smith, Jerome Ste Marie and Deborah Sunter.

I. The national accounts and the underground economy

1. GDP, illegal production and underground production

The so-called hidden economy has been referred to by many terms, such as 'informal', 'parallel', 'concealed', 'unmeasured', 'unrecorded', 'untaxed', 'subterranean'... 'Underground' is perhaps the most commonly employed of these terms.¹ The expression 'underground economy' has also come to assume many different meanings. In the broadest sense, it usually denotes sales of goods and services on which indirect taxes have not been paid, giving rise to income on which taxes and mandatory social security contributions have not been paid either. In this broad definition, 'underground economy' is virtually synonymous with 'untaxed transactions'. In the narrower sense, adopted in this paper, it refers to *the value added (returns to labour and to capital) which is left out of GDP due to underground production, defined as legal economic production hidden from the authorities in order to avoid taxes and regulations.*

In order to understand better what constitutes underground production, it is useful to recall what Gross Domestic Product is intended to measure, that is, the unduplicated value of economic production in the 'market' economy. However, certain activities which do not give rise to monetary income are also counted in GDP. An imputation is usually made when income in kind has a close monetary equivalent in the market economy, such as the net rental income imputed on owner-occupied housing. No imputations are made for volunteer work and household work. A value is estimated for the latter by Statistics Canada, but it is not part of GDP.²

Conversely, there are transactions which do give rise to monetary income but do not fall within the scope of

economic production, such as the sale of used goods. The value of these goods was included in GDP when they were originally produced and to count it again when they are resold would be double counting. Thus, private sales of used motor vehicles are left out of GDP; in the case of commercial sales, the only amount which does enter GDP is the dealer's mark-up on the expenditure side, which translates into profits and wages on the income side. Underground transactions may occur with both types of sale, but only the mark-up on the ones made through motor vehicle dealers could be missed in GDP.³

Capital gains are another type of income which is taxable, but outside the scope of GDP because they do not arise out of current production. Undeclared capital gains would come under the scrutiny of the tax authorities, but they are not part of underground production. There are other examples: inheritances, profit from the sale of land and interest on loans from one individual to another when not related to a business venture.

In principle, GDP includes all production, without regard to its legality. In practice, illegal activities such as the sale of narcotics, although deemed productive in an economic sense in that they satisfy a demand expressed on the market, are left out of official statistics because there is no way of measuring them with sufficient reliability. The official GDP thus refers, by and large, to legal production. Other criminal activities such as robbery or extortion are a transfer of wealth from one person or group to another. They are not productive and do not enter GDP at all.

Whether the omission of illegal production is of consequence to the measurement of GDP is a moot point. Available figures for Canada seem to indicate that illegal production represents at the most 1% of GDP. Some work done a few years ago within Statistics Canada suggested that the value added generated by drug trafficking could have ranged between \$1.3 billion and \$2.7 billion, or between 0.3% and 0.6% of GDP in 1984.⁴ Another study (McCracken, 1987) estimated that sales of drugs

1. See Seymour Berger, "The Unrecorded Economy: Concepts, Approach and Preliminary Estimates for Canada, 1981", *Canadian Statistical Review*, Catalogue No. 11-003E, April 1986.

2. The Canadian System of National Accounts (SNA) follows United Nations guidelines, according to which household production is not to be included in GDP. See Chris Jackson, "The Value of Household Work in Canada, 1986", *National Income and Expenditure Accounts*, Catalogue No. 13-001, first quarter 1992, and Bill Chandler, "The Value of Household Work in Canada, 1992", *Ibid.*, fourth quarter 1993.

3. The distinction is important. Examples of underground transactions are sometimes ill chosen. The sale of used goods through a computer network is a case in point: first, computer networks are not underground, since everyone has access to them; second, sales of used goods by individuals do not enter GDP and are not subject to GST either.

4. The market for heroin, cocaine, marijuana, hashish and chemical drugs was studied, using information from the RCMP and other sources. Assumptions were developed about the number of users, average dosage per user per day and average price per dosage.

could have reached \$2 billion to \$3 billion in 1985, about 0.5% of GDP. On the basis of an addiction rate of 1% of the population aged between 15 and 65, some 200,000 persons, the figure which has been advanced of a \$10 billion a year drug trade in Canada¹ translates into a consumption per addict of \$50,000 a year, surely an upper limit. Once the value of drug imports is deducted from this amount, the value added is considerably less. There are no statistics on prostitution, but a calculation based on the extreme assumptions of half a million customers each spending \$5,000 a year would yield \$2.5 billion, less than 0.4% of GDP in 1993. Research done in other industrialized countries came up with similar findings.² Even if illegal production had increased somewhat in relation to official GDP (legal production), it would still not be large enough to have any impact on the measured growth of the economy.

Classification of Productive Activities with Examples

	Legal activities	Illegal activities
Market productive activity	A. Production and sale of automobiles, housing, restaurant meals, roads	B. Production and sale of narcotic drugs, prostitution, some kinds of pornography
Non-market productive activity	C. Household work, rent, imputed on owner-occupied dwellings	D. Growing marijuana for own consumption

The categorization of transactions into 'legal' and 'illegal' is not always a simple matter. For the purposes of the national accounts, prostitution is classified among illegal activities and left out of GDP because it is largely clandestine, although it is lawful (only solicitation for purposes of prostitution is illegal in Canada). To the extent that underground transactions involve the non-payment of taxes, they constitute fraud and are illegal. However, in the present context, the latter term is usually applied only

to activities which are in themselves illegal. Thus, as defined here, the tobacco and alcohol smuggling belongs to underground production because the importation and sale of tobacco and alcohol are normally lawful activities.

In relation to the diagram below, GDP measures primarily the unduplicated value of economic production in the *market* economy, whether legal or illegal (all of A plus all of B), and ignores non-market production. In practice, the official GDP does not capture illegal production and does include some non-market activities (all of A plus a small part of C).

At the most general level, the expression 'underground economy' refers to the sale of goods and services on which taxes have purposely not been paid and to the associated income which is purposely hidden from the tax authorities.³ It is the portion of the domestic economy which is unobserved, as a result of the hidden activities of some businesses and households. It is generally thought to be concentrated in certain industries which sell mainly to households (construction, restaurants, personal and household services, retail trade), in certain occupations (building trades, mechanics, babysitters...) and in certain types of firms (small, unincorporated businesses, self-employed individuals) and to involve mainly cash transactions. On the basis of the classification of productive activities above, four definitions of the underground economy can be formulated, depending on what is meant by 'total economy' and on who is observing it:

Alternative Definitions of the Underground Economy

1. Market production of legal goods and services that escapes measurement in the official estimate of GDP (part of A).
2. Market production of goods and services, whether legal or illegal, that escapes measurement in the official estimate of GDP (part of A + B).
3. Market production of goods and services, whether legal or illegal, that escapes detection by the tax authorities (part of A + B).
4. Market and non-market production of goods and services, whether legal or illegal, that escapes measurement in or is purposely excluded from the official estimate of GDP (part of A + B + C + all of D).

Under the first definition, the underground economy corresponds to the legal market production which

1. At a recent conference on the underground economy sponsored by the Fraser Institute (Vancouver, April 21-22, 1994), Mr. Tim Killam, an officer from the RCMP's Economic Crime Directorate, cited the figure of \$10 billion as a rough estimate of the value of drug sales in Canada.

2. A study done in the U.S. for 1977 pegged value added by 'productive' illegal activities (drugs, gambling and prostitution) at \$30 billion, or 1.5% of GDP. In France, value added by sales of narcotics and prostitution was estimated at 0.1% of GDP for the same year. Apart from the inherent uncertainty in the results, the large difference between the two countries is because more activities are illegal in the US, notably prostitution and many forms of gambling. Consumption of narcotics was also deemed more widespread in the US at the time. See Blades.

3. The term 'purposely' is important. Income may be undeclared or under-declared for legitimate reasons: by error, on account of ignorance, or simply because it is below the taxable threshold.

goes unmeasured. The second definition extends the first one by including illegal market production. The third is identical to the second in theory, but broader in terms of measurement. As will be demonstrated later on, some underground transactions are captured in the official GDP. This is why the domestic market production which goes untaxed is larger than that which goes unmeasured. Fundamentally, the first three definitions all pertain to transactions that give rise to tax evasion and differ only in scope. The first corresponds, by and large, to what the official GDP measures, the second, to what GDP should measure in principle, while the third definition is closer to that of the tax base, since the tax authorities also draw no distinction between legal and illegal income.¹ Finally, a fourth, seldom employed definition broadens the underground economy to include non-market activities, notably household work and volunteer work, which do not involve tax evasion. The term 'underground economy' does not seem very appropriate here, since household and volunteer work are by no means covert.

Defined as the untaxed market production of legal and illegal goods and services, the phenomenon of the underground economy is closely related to tax evasion. It is nevertheless misleading to employ the two expressions interchangeably. If all underground (and illegal) production entails tax evasion in one form or another, tax evasion is not limited to domestic economic production. Capital gains, income earned abroad and cross-border purchases which are undeclared have nothing to do with the underground 'economy'.

The example of cross-border shopping perhaps best illustrates the distinction between underground economy and tax evasion. These purchases involve no transactions, no economic activity whatsoever in Canada. Cross-border shopping therefore cannot be considered part of the underground economy, even though it may give rise to tax evasion. Another good example is that of workers hired as 'contractors' in the construction industry, a practice allowing construction businesses to avoid payroll taxes and mandatory contributions to unemployment insurance, Canada Pension Plan and workers' compensation. The businesses involved are usually legitimate and show these expenses in their books. The practice certainly constitutes tax avoidance, if not tax evasion, but it is not a form of underground production. *A measure of the size of the underground economy, however*

1. In practice, like national accountants, tax inspectors are probably more successful at detecting underground but 'legal' transactions than entirely illegal and covert ones.

defined, is not a comprehensive measure of tax evasion and should never be interpreted as such.

Underground transactions are far from completely concealed. There is no real separation between the underground and the 'above ground' sectors of the economy. Income earned in one is spent on goods and services sold in the other, and vice versa; earnings from both are channelled through the same financial institutions. Buyers and sellers, goods and services and means of exchange are the same in the two sectors, even if cash transactions are more prevalent in one than the other. The underground economy is not self-contained and does not constitute a separate economic system. Underground transactions exist and underground production occurs, but they are part and parcel of one economic system.

2. Unreported versus unmeasured transactions

The focus of the System of National Accounts is economic production. This is why, with respect to measurement, the primary concern is with underground production rather than with untaxed transactions. GDP, however, in principle as well as in practice, purports to measure not only declared or reported transactions,² but the unduplicated value of all goods and services produced, whether the underlying transactions are reported or not. In fact, a significant proportion of underground production is *de facto* captured in the official GDP because of the data sources and the methods employed in its estimation. The fact that income is not declared does not imply that it is missed in GDP. *Unreported, undeclared or untaxed transactions are not synonymous with unmeasured transactions.*

The method of estimating residential rents in the national accounts will illustrate the point. If the method relied on the gross rents showing on tax returns, GDP could be underestimated, since landlords may declare only part of the rents received, or none at all. Gross paid rents entered in GDP, however, are calculated through the multiplication of the stock of rented dwellings by the average monthly rent paid by tenants, based on a sample of about 20,000

2. Throughout this study, only income is said to be 'declared' or 'undeclared' to Revenue Canada by the recipient; other transactions (payments, sales) are said to be 'reported' or 'unreported' to Revenue Canada, Statistics Canada and other government departments and agencies.

respondents to the Labour Force Survey (LFS).¹ Measured rental income in the national accounts is independent from declared rental income. Even if all landlords cheated on their tax return, the value of gross paid rents recorded in GDP would still be quite accurate.²

Dwellings are easier to count than income. They are enumerated in the census, and housing starts and completions are tabulated every month. Like all statistics, the average rent is not perfectly accurate, but the respondents to the LFS have no good reason to report a lower monthly rent than the one they pay. Rent is an expense for the respondent, not an income which he may want to hide. A respondent who rents an apartment on the black market, at a rent likely below the average, and fears somehow that quoting a 'low' rent could have adverse consequences might quote a higher rent or, more likely, refuse to take part in the survey.

Covert rentals could affect the estimation of the stock of dwellings, however, and this would lead to an underestimation of rents. In cities where rental accommodation is scarce and expensive, apartments can be rented on the black market, in a basement or on an upper floor, at times against zoning by-laws; some of these could be missed in the census. In the same fashion, conversions from a single dwelling to a duplex could be escape detection between censuses. Even if spending on alterations to existing houses was correctly measured, additions to the stock through conversions could still be too low because some homeowners will hide a conversion.³

Although no attempt is made to count illegal production in the official GDP, it may not be missing altogether. Part of the illicit income from the sale of narcotics for instance could be channelled into legitimate businesses through the doctoring of financial statements ('money laundering') and thus

show up in GDP. But most illegal transactions will be undetected in a statistical system not designed to capture them in the first place.

The picture is not as clear cut in the case of underground transactions. On the one hand, they involve activities which the statistical system has been designed to measure. Moreover, since the supplier is responsible for the collection of sales taxes and the payment of associated income taxes, the purchaser has nothing to hide.⁴ Finally, there are many ways of measuring economic activity. On the other hand, insofar as the estimation of GDP and other national accounts aggregates relies on taxation statistics and administrative data which are subject to underreporting, some underground transactions will be unmeasured, and GDP underestimated, despite the checks and balances built into the system. In this respect, some underground transactions are like illegal: they can go entirely undetected.

In summary, from the perspective of the national accounts, the only underground transactions that need be measured in GDP are those relating to market-based economic production, whether legal or illegal. Among those, some are already captured in the official GDP and others are 'missing'. This study considers primarily those transactions that escape measurement in GDP, not those that escape detection by the tax authorities (which are either missing or captured in GDP). It largely ignores illegal activities, just as they are left out from the official GDP. The focus is primarily on the first definition outlined above.⁵ The relationships between the various sectors of the economy, market, non-market, legal, illegal, are illustrated in the figure on the next page. Before we attempt to determine how much could possibly be missing from GDP due to underground production, it is useful to recall briefly how GDP is calculated.

1. The sample size of the monthly LFS is currently 58,000 households, representing about 110,000 persons. Since renter households make up 35% of the total, roughly 20,000 households answer the questions on rent.

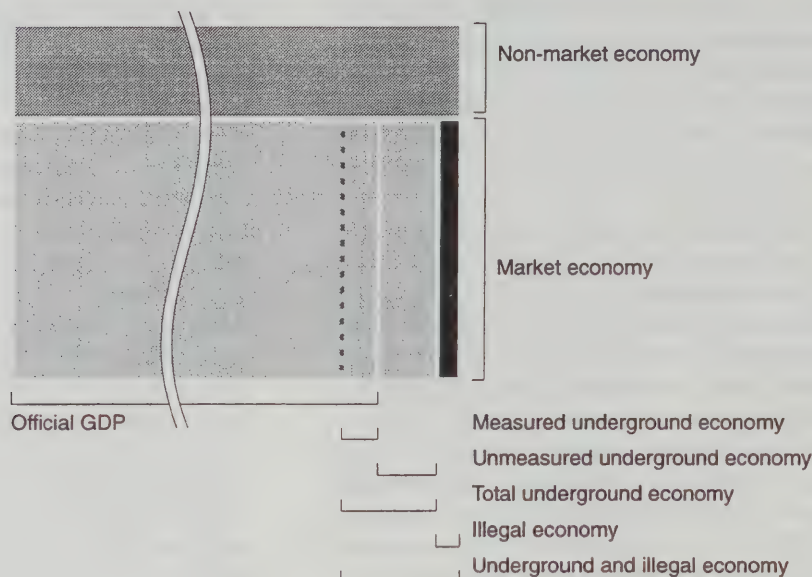
2. Rent imputed on owner-occupied dwellings is also calculated as the product of their stock times a 'rental value' based on the average rent reported by tenants; there is no issue of owners misreporting the equivalent rental value they attribute to their home since that information is not asked.

3. The effect of such conversions on the count of dwellings would be mitigated by conversions in the other direction, from duplex to single for instance, of which the estimate comes from the same source and could also be inaccurate. The issue of the underestimation of rents is discussed in depth in Part II, section 3.4.

4. This is not just a rhetorical argument. In a recent poll by Gallup Canada (November 29, 1993), the first of its kind, 33% of respondents acknowledged having paid for a good or a service in cash to avoid paying sales taxes during the previous twelve months. The results, based on 1,004 telephone interviews with a stratified sample of the adult population, are deemed accurate within 3.1 percentage points, 19 in 20 times.

5. The study actually considers the first three definitions of the underground economy: the value of the underground transactions already captured in GDP is measured approximately further down, in Part Three, and the available evidence on the size of illegal production in relation to GDP was discussed above.

The Underground Economy



3. How is GDP calculated?

The value of production in the economy is measured in three ways, which in principle all yield the same result. The first, known as the *sum of incomes* approach, entails adding up the incomes generated in the production process, that is, wages and profit in diverse forms (profits of incorporated business, net income of unincorporated business and investment income of persons and governments). Incomes in the form of transfers are *not* counted in production. This income-based measure of GDP can be expressed at factor cost or at market prices, depending on whether or not it includes the aggregate 'indirect taxes less subsidies'.

Alternatively, GDP is equal to the sum of all sales to final users, that is, to households, to government, to business on capital account and for export. Imports must be deducted from this summation since they are implicitly included in final sales, yet are not part of domestic production. Sales from one firm to another (intermediate production) are also omitted to avoid double counting, since intermediate production is embodied in the output sold to final users. This *sum of expenditures* approach also yields an unduplicated measure of production, expressed at market prices. Expenditure-based GDP can be shown at factor cost by subtracting as a whole the aggregate of indirect taxes less subsidies which enters income-based GDP explicitly, or by deducting the taxes and subsidies applicable to each commodity in final sales, estimated using input-output techniques.¹

Finally, GDP can be measured by taking the gross value of production for each firm or industry, and subtracting the portion of costs of production which are purchases from other firms, including imports, to yield the net value added in production. The deduction must be made, otherwise some output will be counted twice or more. This method is known as the *sum of net values added*. It is particularly useful when the aim is to measure the output of individual industries and their contribution to GDP, since the sum of value added over all industries is equal to GDP at factor cost. For this reason, GDP calculated through this approach is sometimes referred to as 'industry-based'. It is only expressed at factor cost, because indirect taxes and subsidies are not part of the value added by firms and industries in the process of production.

The first two methods, the sum of incomes and the sum of expenditures, are employed in the Income and Expenditure Accounts. The value added or industry-based method is the cornerstone of the Input-Output Accounts, although this system allows the calculation of all three measures of GDP. At the outset, the various estimates of GDP are by and large calculated separately from each other. Differences always arise between them, due to errors or gaps in the source data, imperfect estimation techniques, etc. These are investigated, adjustments and corrections are made

1. See Philip Smith, "The Allocation of Indirect Taxes and Subsidies to Components of Final Expenditure", *National Income and Expenditure Accounts*, Catalogue No. 13-001, third quarter 1990.

and the estimates are brought closer until they are deemed 'reconciled', in the sense that the gap between them is judged acceptable.

This reconciliation is part and parcel of the more general revision process of the national accounts. It takes place quarterly between the income-based GDP and the expenditure-based GDP, after which any remaining discrepancy is divided in two, with one half subtracted from the higher estimate, and the other added to the lower one. After a two year lag, once a year, the estimates of GDP calculated in the income and expenditure accounts are further reconciled with those produced in the input-output accounts.

The input-output accounts are a balanced system revolving around two fundamental identities, one between the supply and demand for a commodity, and the other between inputs into an industry's production and its output. This twofold balancing of supply and demand for all commodities and of inputs and outputs of all industries provides a consistency check on all the estimates and thereby ensures that income-based and expenditure-based GDP are not only brought closer, but made virtually equal.¹ It prevents the recording of an amount, say, of \$4 billion as spending on childcare on the expenditure side of GDP, and of only \$3 billion on the same account on the income side, as wages or as net income of unincorporated business, a situation which might arise when income-based GDP and expenditure-based GDP are calculated independently and incomes are more likely to be underreported than expenditures.

It has been observed that measured income tends to be lower than measured expenditure in GDP. The evidence of the Canadian national accounts certainly bears that out, since this has been the case in 56 of the 67 years on record. The most evident explanation is that the estimation of income-based GDP often relies on taxation statistics which tend to be understated. If this is so, then the magnitude of the statistical discrepancy between the two sides of GDP might be indicative of the size of the underground economy.

Unfortunately, such an approach reveals little about the importance of underground production in Canada

since the income-based and expenditure-based estimates of GDP have always been reconciled and have never been totally independent. They do diverge mainly in one direction, but that divergence is quite small: the total statistical discrepancy has averaged less than one half of one per cent of GDP since 1961. In addition, when measured income is higher than measured expenditure, which has been the case for 48 quarters out of 188 since 1947, one is left looking for an explanation.² This being said, even if the level of the statistical discrepancy itself is not very revealing, a significant increase of this divergence like the one noticed in Canada's GDP since 1991 may include a growing underground economy. This question is addressed directly in Part III of the study.

To summarize, the process of reconciling the various estimates of GDP in the SNA is carried out in two stages. First, income-based GDP and expenditure-based GDP are reconciled quarterly in the income and expenditure accounts. At the end of this stage, the estimates are closer, but still largely independent and imbalances can and do occur between them. During a second phase, the estimates of GDP calculated in the income and expenditure accounts and in the input-output accounts are further revised and reconciled, and are brought into balance. At the present time, the extensive reconciliation, which yields the more reliable estimates, has been carried out until 1990.

The method of estimating GDP in Canada, along with its inherent process of revision and of reconciliation between three estimates, has a twofold consequence for the measurement of underground production. First, the fact that the statistical discrepancy is so small in percentage of GDP is no indication that there is little underground production, but it does prove conclusively that most of what is missing from GDP on this account has to be missed in all three estimates, otherwise the imbalance will be detected. Second, underground production is even more difficult to capture in the most recent period when the estimates are still based on incomplete data and have not yet had the benefit of going through an extensive reconciliation.

In the SNA, if the gross output of an industry is correctly measured, that is, reflects both legal and underground production, overall GDP will not be affected despite the existence of underground transactions in that industry. The rental of dwellings is

1. The statistical discrepancy which remains even after the reconciliation of income-based and expenditure-based GDP in the income and expenditure accounts has no equivalent in the input-output accounts: in the latter, both estimates of GDP are identical.

2. In 1988, measured income exceeded measured expenditure by \$4 billion, and in 1989, by \$400 million.

a case in point. Even if not a single landlord declared rental income, gross or net, gross paid rents (the gross output of the 'rental' industry) would still be valued at \$21 billion, and net income from those rents at \$1.4 billion in GDP for 1992, because underground transactions have no effect on the estimates. If the gross output of an industry is underestimated (due to underground transactions or otherwise), GDP will be underestimated if part of that output is sold at the final demand level (personal expenditure, government current expenditure, investment and exports). If on the contrary that industry's output is all sold at the intermediate demand level, that is, to businesses, the gross output of the economy will be understated, but not the GDP.

To give a concrete example, when the gross output of the industry of barber and beauty shops is understated by \$100 million, the GDP or value added of that industry and personal expenditure on hair care are also understated, perhaps not by the full \$100 million, but by most of it. On the other hand, when the gross output of business associations, entirely purchased by other businesses, is understated by \$100 million, the GDP or value added of that industry is understated at the most by \$100 million. But the intermediate expenses of the other businesses are understated, and the value added attributed to them is overstated, by this same amount. In this instance, the missing \$100 million in one industry is entirely offset by the overstatement of the value added of all the other industries that purchased the services of that industry. GDP is unchanged. Only gross output of the economy is understated.

Underestimation of output on account of underground transactions could be a more serious problem in the case of service industries for which the statistical coverage is not as complete as for goods producing industries and where transactions are also more easily hidden. The receipts most likely underreported (but not necessarily underestimated) are those of small businesses in construction, trade, accommodation and food services, amusement and recreation, and personal and household services. The problem does not significantly affect regulated industries, those in the public sector or those where large businesses predominate: utilities, health, education, communications and finance, insurance and real estate, and most transportation industries.

II. Estimation of underground production potentially missing from the 1992 GDP

So far, we have defined underground production and drawn the distinction between unreported and unmeasured transactions. In this section, we undertake to estimate the value of legal economic production that escapes measurement in the official estimate of GDP because it is hidden in order to avoid taxes and regulations. The analysis takes into account which areas of the economy are most likely to be subject to underground activity, and which ones are least well measured in the national accounts. The intent is to establish an upper bound estimate for the possible size of the underground economy. Like the measurement of GDP itself, the question can be addressed from the angles of income, expenditure and value added. An analysis centred on missing income is fraught with difficulty, because business income (profits, net income of unincorporated business) is essentially a residual, both in business books and in the national accounts. An examination of final demand, on the other hand, offers a twofold advantage: the estimates of final demand, broken down into hundreds of categories, are far more detailed and are expressed in volume as well as in value. This is why underground economic activity is best approached in terms of expenditures.¹

On the expenditure side of GDP, only investment in residential construction and personal expenditure on goods and services could be significantly underestimated due to underground transactions. Imports and exports would also be marginally affected, and will be dealt with first. The other components of GDP, government expenditure, business investment in plant and equipment and in inventories are not ones which lend themselves to underground activity.²

1. Berger's estimate of the upper limit of unrecorded production in 1981 was made on both sides. However, underground transactions have changed in nature and scope since then (tobacco smuggling was insignificant for instance). The statistical system has also evolved. New data have become available, and the national accounts have gone through a historical revision in which estimation methods were considerably revamped. For these reasons, it was felt that adopting the same approach for the year 1991 or 1992 would not have yielded meaningful results.

2. See Appendix I for an explanation.

1. Imports and exports of goods and services

1.1 Imports

Imports of goods are understated, at a minimum, by the value of the tobacco and alcohol smuggled into the country. But this understatement, in itself, does not necessarily have an incidence on GDP. Imports do not enter GDP. Because they are not part of domestic production, they are a deduction against GDP on the expenditure side:

"Imports are excluded from GDP... They enter final sales both directly, as finished products purchased from abroad, and indirectly as intermediate inputs to the production process... All of the five expenditure components, personal consumption, government current expenditure, government investment, business investment and exports, have some import content as well as some domestically-produced content. It is not feasible to extract the imported element separately from each spending component, because imported goods and services can enter final sales indirectly as well as directly. Accordingly, the total of imports is subtracted as a whole." (*Guide to the Income and Expenditure Accounts*, p. 40).

This does not mean that the omission of the value of smuggled goods has no impact on GDP, but rather that this value itself is not missing from GDP. Let us take the example of cigarettes to illustrate the impact of smuggling on GDP. The cigarettes smuggled into Canada are largely manufactured here. They have been exported legally and have been counted as part of exports: nothing is missing from Canada's GDP on that account. However, the black market value of contraband cigarettes is omitted from personal expenditure, while their import value is omitted from imports. Since personal expenditure enters GDP with a positive sign, and imports, with a negative sign, what is missing in GDP due to smuggling is the difference between black market value and import value, in other words, the aggregate mark-up or profit of smugglers and sellers.

For 1992, Statistics Canada presently estimates sales of contraband tobacco to consumers at \$1,057 million, contraband imports at \$619 million and the reduction in contraband inventories at \$15 million, for a net positive effect on GDP of \$423 million, equivalent to 0.06% of GDP. Corresponding figures for 1993 are \$1,868 million for sales to consumers, \$1,095 million for contraband imports, \$26 million for

the reduction in contraband inventories and \$747 million for GDP, reflecting a 75% increase in a year, but still only 0.1% of GDP.¹

Alcohol smuggling has existed for a long time and there is evidence that it has been on the increase recently, possibly spurred by that of cigarettes. The Liquor Control Board of Ontario (LCBO) claims that illegal imports of spirits cost it \$500 million in lost sales in 1993. These imports are valued at legal prices (which include taxes and the LCBO mark-up), not at the lower black market prices at which they would be valued in GDP. Pegging the black market prices at 60%, on average, of LCBO prices yields illegal imports of spirits of about \$300 million in Ontario. If smuggling were as widespread in the rest of the country, the figure for Canada as a whole would be about \$800 million in 1993. The import value of this alcohol would be much less, anywhere from 40% to 60% of its black market value. The net effect on GDP would be equal to the smuggler and retailer mark-ups in relation to these sales.²

Precious jewellery is also subject to a particular excise tax on top of the GST and provincial sales tax and is easy to conceal, making it attractive to smugglers. But spending on jewellery recorded in GDP represents only 10% of recorded spending on alcohol and tobacco combined. The market for smuggled jewellery is thus much more limited. As illegal imports of tobacco and alcohol could reach \$1 billion at most in 1992, it is difficult to imagine illegal imports of jewellery exceeding \$100 million. The Canadian Jewellery Association claims that underground transactions in jewellery could have amounted up to \$700 million in 1993.³ Some of that would be hidden imports of loose stones and precious jewellery. One may safely assume that other goods which can be legally imported are not smuggled into the country in significant quantity because they are not subject to such high indirect taxes as spirits, tobacco and jewellery.

Too low estimates of cross-border shopping, declared or undeclared, would also lead to an underestimation of imports, but unlike smuggling, not to an

underestimation of Canada's GDP.⁴ Purchases made outside the country for personal consumption only (that is, not for resale) do not give rise to any mark-up or profit in Canada needing to be counted in our GDP. Their effect on imports is entirely offset by their effect on personal expenditure. Whatever the level of purchases made across the border, the same amount would be recorded in personal expenditure with a positive sign, and in imports with a negative sign, leaving GDP unchanged.

This is not to say there is no tax evasion with respect to cross-border shopping. There is, and it was acknowledged explicitly by the national accounts when, as reported in the article just cited, imports and personal expenditure were raised for 1990 and 1991 to account for undeclared purchases such as gasoline. The point is that underestimation of cross-border shopping does not result in an underestimation of GDP and can be ignored here. Undervaluation of non-merchandise imports can also be disregarded. The addition of 'missing' service imports would either leave measured GDP unchanged, or even reduce it (if the imported services missing under the heading of imports already showed up elsewhere in final demand).

1.2 Exports

Merchandise exports may be underestimated through smuggling or through undervaluation of declared transactions. But there are few goods or services for which underground transactions relating to exports are evident or suspected, and there would appear to be no example of a Canadian product smuggled out of the country on a large scale. Possibilities of illegal exports are rare birds whose capture is forbidden, as well as fish and arms, but such trade would be statistically negligible. Canada is not an important arms manufacturer, and the fish stocks are at an all time low. Illegal sales of uranium or plutonium could bring in billions of dollars, but production and exports are very strictly controlled. Our merchandise exports to the United States, making up roughly 70% of the total, are valued on the basis of US Customs import documents in which our exports are not likely to be undervalued, quite the contrary.⁵

1. See section 3.2 for further explanation, and tables 6 and 7 for estimates in volume and in value.

2. LCBO, "The Impact of Smuggling and Illegal Manufacturing of Beverage Alcohol", presentation to the Standing Committee on Finance and Economic Affairs of the Ontario Legislature, November 18, 1993. See section 3.3 for the calculation of the net effect on GDP of all underground transactions related to alcohol.

3. Globe and Mail, November 25, 1993.

4. See Katharine Kemp, "Cross-Border Shopping - Trends and Measurement Issues", *National Income and Expenditure Accounts*, Catalogue No. 13-001, third quarter 1992.

5. And vice versa: the value of US exports to Canada is estimated from Canadian Customs import documents, with the very effect of minimizing undervaluation of trade in both countries.

Businesses have no real incentive to hide exports. There are usually no export duties (with notable exceptions for cigarettes, very recently, and for oil from 1973 to 1985). As to the import duties paid by the purchaser in the country of destination, they have been either abolished or significantly lowered on most commodities in recent years. About 90% of Canada's exports involve vehicles and parts, crude petroleum, natural gas, lumber, pulp and paper, ores, metals and alloys, etc., and are all done above board, often at international prices. If the remaining 10% of exports were somehow understated overall by 5%, and this is highly speculative given the lack of evidence, the resulting amount would be \$800 million in 1992. The percentage of 5% would imply a much higher average undervaluation if in all likelihood only a small proportion of exporters is actually defrauding.

Trade in services comprises five categories: travel, freight and shipping, business services, government transactions and other services (mainly spending of foreign students). Only business services, bringing in about 40% of total service receipts, lend themselves to underestimation due to underground transactions, through non-reporting or undervaluation. However, within that broad category, most of the market belongs to large, well-established and often regulated companies, not engaged in underground production. For example, in 1992, about 70% of business service receipts came from insurance, air transport, tooling, airplane rentals, computer services, brokerage services, gold refining, communications and royalties and patents. An undervaluation of the remainder by 10%, a higher proportion than for merchandise exports to reflect that service receipts are easier to hide, would add up at most to \$300 million which, combined with the potential \$800 million in hidden merchandise trade transactions, would yield \$1.1 billion, less than 0.2% of GDP in 1992. This total is very likely an upper limit because even anecdotal evidence is lacking in this instance.

Transfer pricing, whereby goods and services are valued below or above their fair market value, occurs in transactions between related firms or various establishments of a single company and could lead to an undervaluation or an overvaluation of exports and imports. A parent company may undervalue its exports of merchandise to a subsidiary in another country for example and overvalue its non-merchandise exports instead, in order to avoid some import duties in the country of the subsidiary, which has no effect on GDP. As such, however, transfer pricing is legal and does not constitute an instance of underground production.

2. Investment in residential construction

The example perhaps most often mentioned in relation to the underground economy, apart from tobacco smuggling, is that of tradesmen in construction doing work for households outside their regular job. Construction workers may also be hired 'off-the-books' by contractors. The construction of new dwellings and home renovations ('alterations and improvements' in the national accounts), along with minor repair and maintenance work, are considered prime areas where underground transactions occur.

One point should be clarified at the outset. Spending by homeowners and landlords on repair and maintenance is treated as an intermediate expense, not as investment, in the national accounts. It is offset against gross rents in the calculation of net rental income. Any underestimation of spending on repairs by landlords and homeowners translates into an overestimation of net rental income, leaving GDP unchanged. At issue here, therefore, are only underground transactions related to investment in residential construction (classified as 'new construction', 'alterations and improvements' and 'transfer costs', the latter two applying to existing dwellings).

One way to assess the validity of the national accounts estimates for residential construction (new construction and home renovations) is to compare them to sales of lumber and building material dealers (as a proxy for the total consumption of lumber and building materials). The ratio of one to the other, shown in line 16 of Table 1, gives us an approximation of the building materials content of residential construction.¹ The similar ratios based on supply and disposition data from the input-output tables, shown here for material inputs (line 17), service inputs (line 18) and value added (line 19) in residential construction (line 17), do not fluctuate as much. These ratios have been calculated, so far, up to 1990.

As sales of lumber and building materials are reliably captured in the statistical system, a plausible ratio of materials to output implies that the measured output is also plausible. This being said, many factors

1. Not all building materials are purchased from lumber dealers (kitchen cabinets purchased directly from manufacturers for instance), and the latter sell materials employed not only in residential construction, but in some non-residential and repair construction as well.

Table 1. Investment in Residential Construction and Sales of Lumber and Building Materials¹

	1985	1986	1987	1988	1989	1990	1991	1992
	millions of dollars							
1. Single dwellings	7,153	9,827	13,264	13,542	15,507	13,410	10,206	11,115
2. Semi-detached dwellings and row housing	835	987	1,479	1,680	1,831	2,010	1,933	2,532
3. Apartments	2,138	2,846	4,294	4,432	4,771	4,619	3,104	3,173
4. Government residential construction	16	17	15	29	19	13	13	15
5. Work put in place by business (1 + 2 + 3 - 4)	10,110	13,643	19,022	19,625	22,090	20,026	15,230	16,805
6. Cottages	594	522	693	718	935	908	638	622
7. Conversions	142	135	162	167	148	126	124	103
8. Mobile homes	190	189	223	239	146	135	102	116
9. Supplementary costs	617	854	1,387	1,601	1,734	1,828	1,574	1,707
10. New construction by business (5 + 6 + 7 + 8 + 9)	11,553	15,343	21,487	22,350	25,053	23,023	17,668	19,353
11. Alterations and improvements	9,320	9,824	11,099	12,463	13,528	13,022	11,225	11,528
12. Total, business residential construction ² (10 + 11)	20,973	25,167	32,586	34,813	38,581	36,045	28,893	30,881
13. Sales, lumber & building material dealers	13,385	15,700	18,667	19,867	19,251	17,628	15,692	17,622
14. Of which, exports (estimated)	1,673	1,963	2,333	2,483	2,406	2,204	1,962	2,490
15. Of which, domestic sales (13 - 14)	11,712	13,737	16,334	17,384	16,845	15,424	13,730	15,132
16. Ratio, domestic sales of lumber & building material dealers to residential construction (15 / 12)	.558	.546	.501	.499	.437	.428	.475	.490
17. Ratio, material inputs to output, residential construction ³	.610	.587	.589	.575	.564	.558	n/a	n/a
18. Ratio, service inputs to output, residential construction ³	.080	.084	.082	.085	.083	.087	n/a	n/a
19. Ratio, value added to output, residential construction ³	.310	.329	.329	.340	.353	.355	n/a	n/a

n/a Not available

Note 1: All estimates without GST. Provincial sales taxes cannot all be removed.

Note 2: Excludes transfer costs pertaining to resale of existing dwellings.

Note 3: Calculated with the input-output tables.

Sources: National Accounts.

contribute to the increase in the material content observed in 1991 and 1992. First and foremost, profit margins shrink during a recession. The construction industry is particularly sensitive to the economic cycle, and building contractors are forced to reduce their margins or risk bankruptcy. Housing starts fell by 15.7% in 1990, by another 14.0% in 1991, and increased in 1992, but only by 7.7%. Moreover, when unemployment is high and incomes are hardly increasing or even decreasing, as has been the case for a few years, homeowners, overall, have less money to spend on renovations and have more time to do work themselves. Finally, an increase in the material content may indicate that underground transactions are growing: sales of building materials are well captured, but contract and labour costs could be increasingly 'missed'. Other things being equal, a higher ratio suggests that some output is missing.

On the basis of the ratio of domestic sales of lumber and building material dealers to output (line 16) alone, it is not possible to determine conclusively whether underground activity is on the rise in construction, but the increasing ratios observed for 1991 and 1992 may be indicating just that. This being said, the very level

of the ratios derived for construction from the input-output tables (lines 17, 18 and 19) and the stability of these ratios over time do confirm that the national accounts estimates for residential construction are reasonably accurate and that output could be escaping measurement only at the margin.

The ratios of material inputs to output would be much higher if the underground transactions occurring in the construction industry were all missing from GDP. Similarly, if national accounts estimates of output were adversely affected by growing underground transactions in construction in 1991 and 1992, the proxy ratio (line 16) would not only have increased, it would exceed its level of the recent past. In both cases, this would imply an unrealistic production function. If the increase in the proxy ratio in 1991 resulted from growing underground transactions alone, then its decrease in 1989 and 1990 would seem to imply a sharp drop in underground transactions during those two years, which is very unlikely.

Measured investment in residential construction is fairly reliable in spite of underground activity because

Table 2. Net Income of Unincorporated Construction Businesses: National Accounts versus Revenue Canada

	1985	1986	1987	1988	1989	1990	1991	1992
	millions of dollars							
1. National Accounts	2,494	2,821	3,272	3,512	3,775	3,657	3,530	3,695
2. Revenue Canada	980	1,139	1,328	1,500	1,614	1,561	1,222	n/a
3. Gap, 1 - 2	1,514	1,682	1,944	2,012	2,161	2,096	2,308	-

n/a Not available

Sources: *National Income and Expenditure Accounts*, Catalogue No. 13-201, Table 32, and Revenue Canada, *Taxation Statistics*, Table 9.

it is largely independent from the receipts declared or reported by businesses and self-employed workers in the industry. As a result, most hidden transactions in construction are already captured in GDP. In fact, estimates for spending on home renovations were completely revamped during the last historical revision of the national accounts in 1986 explicitly to account for undercoverage and underreporting. National accounts estimates for net income of unincorporated construction businesses are now considerably higher than corresponding amounts declared to Revenue Canada. For all intents and purposes, the gap between the two (Table 2), of \$2.1 billion in 1990 and \$2.3 billion in 1991, is due to an imputation for hidden net income.

The possibility that some underground transactions in construction are still missing from GDP cannot be excluded however. In order to determine how much these could plausibly amount to, it is necessary to review how the national accounts estimates in this area are put together.

2.1 New residential construction

The estimation of the value of new housing construction combines housing starts, average values of building permits and work put in place coefficients. The latter measure, by month of start, province and type of dwelling (single dwellings, semi-detached dwellings, row housing and apartments), the volume of work on an average 'start' usually carried out in each construction period. In the case of single dwellings, 50% of the work is normally done in the first quarter, about 40% in the second quarter, and the remainder, in the third quarter after the start. The value of work put in place in a given period is calculated by multiplying these coefficients by the value of housing starts (itself derived as the product of the number of starts and average building permit values) for that period and previous periods, and summing. The value of construction work on conversions (from one type of dwelling to another) and on cottages is based on building permits, and that

of mobile homes, on manufacturers' shipments. Finally, an estimate of costs other than for the construction itself (legal, architectural and mortgage fees, land development fees imposed by municipalities and GST), not reflected in building permit values, is added on separately.

Statistics on housing starts come from the Canada Mortgage and Housing Corporation (CMHC) and are considered reliable. It is difficult to build a dwelling without obtaining a permit. Apart from the monthly survey of building permits carried out by Statistics Canada, covering municipalities in which live 95% of the population, the CMHC has access to records of municipalities and hydro companies and has its own information from buyers getting CMHC approved mortgages. It verifies when the construction work authorized on the building permit actually begins and identifies housing starts in areas where no permit is required or where construction is undertaken before a permit is issued. A small number of starts are probably missed, but not on account of underground activity.

Values reported on building permits on the other hand are subject to understatement. Builders have a twofold interest in understating the cost of construction: to facilitate the hiding of income (coming from work done outside the original contract, for instance), and to save on the cost of the permit itself, usually proportional to the cost of construction excluding overhead costs and profit. But municipalities have the opposite interest and will not issue a building permit for a house with a value that is unreasonably low.¹ The price of new homes on the market is also well advertised, and is a good gauge of

1. Generally, outside Quebec, municipalities assume the cost of servicing the land, and finance it through the building permit, which may amount to several thousand dollars. In Quebec, the builder assumes that cost directly and the permit is usually a flat fee, sometimes less than \$100, and the incentive to pay less for the permit is non-existent. On the other hand, the undervaluation of the construction cost with a view to hiding income could very well be easier, municipalities not having an immediate interest in preventing it.

their cost of construction. Building permits issued by municipalities are thus in some sense already 'adjusted' for undervaluation. Builders may undervalue a dwelling at the margin, perhaps by 10% or 15% at the most.

In addition, Statistics Canada makes another upward adjustment to average building permit values to reflect the builders' margin, undervaluation and omitted material costs such as landscaping. These blow-up factors vary by type of dwelling and province, and are above average for Quebec where building permit values are more easily understated. In 1992, for Canada as a whole, they were 9% for single dwellings, 10% for semi-detached dwellings and 19% for row housing and apartments.

Notwithstanding these adjustments, there could still be some understatement of building permit values through undervaluation at the margin or the omission of part of the work contracted out after issuance of the permit. At the most, it could reach 10% for single dwellings (\$1,112 million in 1992), 5% for semi-detached dwellings and row housing (\$127 million), 5% for apartments (\$159 million), and 10% for mobile homes (\$12 million), on which work may also be done outside the original contract. The assumption of a greater average undervaluation for single houses simply takes into account that they are subject to wider variations in value and that most of the expensive, custom built dwellings fall in this category. It does not contradict the fact that average profit margin (as indicated by the blow-up factor) may be lower for single dwellings than for row housing and apartments.

Where a contractor builds a house for himself and 'resells' it to allow the purchaser to avoid payment of part of the GST, that construction is captured correctly in GDP. The fully applicable GST is deemed paid and added to the estimate. The tax evasion leads temporarily here to an overstatement of expenditure-based GDP at market prices, counterbalanced on the income side through an increase in the statistical discrepancy. No production is missing from GDP. (In the long run, the GST entered on the expenditure side of GDP is constrained by GST collections entered on the income side, and the imbalance disappears).

The value recorded in GDP for construction of cottages in 1992 is \$622 million. This amount is already adjusted for undercoverage and undervaluation, because the survey information is believed to be inadequate. The increase in the stock of seasonal dwellings was estimated at 9,000 units for 1992, on the basis of the proportion of households

owning a vacation home, while fewer than 2,000 building permits were issued for cottages that year.¹ Reported building permit values are also blown-up, much more than for new dwellings (to an average cost of \$69,000 excluding land in 1992). The substantial upward adjustments in the number and the average value of new cottages are not intended specifically to account for possible underground transactions in this area, but they are probably sufficient to capture them nonetheless. Another upward adjustment of 25% to account for what might still escape measurement would yield \$156 million and has to be considered an upper limit. It would imply either over 11,000 starts, or an average cost of \$86,000 per unit excluding land, both almost unrealistic figures.

The underestimation could be much higher for conversions from one type of dwelling to another (from a single to two dwellings and vice versa, and 'winterization' of cottages for example). Municipalities do not have as good a yardstick to judge the construction costs being reported: few permits of this kind are issued and the work is less standardized than for new dwellings. On the other hand, many municipalities have inspectors who verify some of the work undertaken for compliance with building codes and standards and for assessment purposes, so that those who do request a permit may understate their costs, but again only up to a point. The problem is that there is no way to estimate the construction work carried out without a permit. Unlike new dwellings, conversions can be hidden. What is lacking in this instance is a reliable volume measure equivalent to housing starts.

A total of 3,500 conversion permits were issued in 1992 with a total value of \$103 million, with an average cost of \$29,000.² A ratio of two hidden conversions for a reported one is conceivable. Although there are no other statistics to go by, the hidden conversion, usually the addition of an apartment, is probably one where the average cost of the work is lower since it is on a smaller scale than the conversion of a double dwelling into a single one. It is more difficult to hide a large-scale conversion from

1. According to the Family Expenditure Survey (Catalogue No. 62-555, abbreviated as Famex), an estimated 653,000 households, or 6.4% of the total, owned a vacation home in 1992. This figure includes winterized vacation homes and homes owned outside the country, which are not part of the estimated stock of 570,000 cottages in 1992.

2. This cost may seem high for the conversion of the basement or the upper floor of a house into an apartment. But large scale conversions from a duplex to a single dwelling, also included here, are likely much more expensive.

municipal inspectors. If this is the case, a hypothetical adjustment of 200% would actually reflect a ratio of hidden to reported conversions higher than two to one, and could be considered an upper limit. It would yield another \$206 million in 1992.

Some supplementary costs do not give rise to underground transactions (GST, land development fees, mortgage fees and insurance). The other costs under that heading (essentially legal and architectural fees and surveying costs) are mainly incurred for new dwellings and probably not subject to widespread hidden transactions. They are estimated as a percentage of the value of construction work put in place and as a result could be underestimated in the same proportion, roughly by 10%, or \$111 million in 1992.

To summarize, the underground transactions related to residential construction possibly escaping measurement in the official GDP could amount at the most to \$1,883 million in 1992, broken down as follows:

	\$millions
Single dwellings	1,112
Semi-detached dwellings and row housing	127
Apartments	159
Mobile homes	12
Cottages	156
Conversions	206
Supplementary costs	111
<i>Total</i>	1,883

2.2 Alterations and improvements

The estimation of spending on 'alterations and improvements' to existing dwellings relies on two sources: the annual Homeowner Repair and Renovation Expenditure Survey (HRRES)¹ and statistics on building permits. Homeowners account for over 80% of that type of spending, landlords, for over 10%, cottage owners and tenants, for the remainder.

The HRRES, with a sample of 25,000 households in 1992, is the source of information on homeowner spending and is believed to yield unbiased results: a) the survey is confidential; b) the homeowner is not asked for the name of his contractor or whether he paid the applicable taxes on the transaction; and c) the contractor, not the homeowner, is responsible for

the tax liabilities arising from it. Some respondents might still hide spending made 'under the table', but others might inflate it by the taxes they should have paid.² Others again may understate their spending, even 'formal' transactions, under the impression that reporting them will result in higher property taxes. Those who are uneasy about reporting, however, will simply decline to take part in the survey, in which case the average spending of the respondents will be imputed to them since there is no reason to believe that their own spending differs significantly from that of respondents. A downward bias in the results on account of underground transactions is possible, but likely small.

Homeowners are asked to report separately the cost of the materials purchased (building materials, furnace, above ground swimming pool) and the cost of contract work, which includes both materials and labour. In the case of built-in appliances and wall-to-wall carpeting, the cost of the goods themselves might be reported under materials and the cost of installation under contract work, or the total cost might be reported under contract work. For 1992, the survey recorded spending of \$3,232 million on materials, and of \$7,188 million on contract work, for a total of \$10,420 million.³ It is the contract work which might be underreported or not reported at all if it was done under the table. It could perhaps be underestimated, on the outside, by 20%. This would represent an extra \$1,438 million, about 14% of the 1992 estimate for homeowner renovations.

The assumption of a 20% underestimation is not purely conjectural. A 10% underestimation is deemed a plausible upper limit in construction of single dwellings, and is a plausible one for contract work on renovations as well. However, the introduction of the GST combined with the recession could have prompted more homeowners to have work done under the table. The proportion of households who reported spending on contract work dropped by 10% in 1991 (from 20.8% to 18.7% as shown in Table 3). If that drop reflected growing underground activity,

1. See *Homeowner Repair and Renovation Expenditure in Canada, 1992*, Catalogue No. 62-201.

2. This is occurring in the case of the spending on tobacco reported to the 1992 Famex. See section 3.6.

3. The 1992 results of the HRRES were released in December 1993 and will be incorporated in GDP in June 1994. The definition of renovations in GDP is broader than in the survey: it includes 'additions, renovations and new installations' as defined in the survey, as well as 'replacement of equipment' and 'complete re-roofing'. The figures quoted in the text for total and average spending are thus higher than those appearing in Table 3, taken directly from the survey under the heading 'additions, renovations and new installations'.

then the 10% upper limit becomes too low and should logically be revised to about 20%.

This percentage may not seem very high. One must keep in mind though that a portion of what is reported for contract work is spent on building materials. The implied underreporting of the value added (wages and profit) in contract work under this assumption would thus be higher than 20% on average, and this percentage is applied to amounts reported by homeowners, not by contractors. In addition, survey results appear quite plausible at face value: the \$10,420 million total in 1992 translates into almost \$1,600 per homeowner, or \$4,460 on average for the 35.5% of homeowners who did report any spending. Homeowners do not make large capital improvements every year. Amounts recorded in GDP under this heading are five times the value of building permits issued for renovations.¹ This difference in itself does not solely reflect underground transactions, since many capital improvements (replacing the furnace and installing wall-to-wall carpeting for instance) do not require a building permit. It does suggest however that homeowners are less reluctant to respond to the HRRES than to request a building permit and lends credibility to the survey results.

Another way of looking at survey results is the following. Let us assume that contract work done under the table is not reported at all, while purchases of materials, done legally, are all reported and relate to the contract work done under the table. As purchases of materials add up to \$3.2 billion (including GST and PST), or about \$2.8 billion excluding taxes, and the relationship between the value added and the material content is close to 50/50, the maximum value of hidden contract work would be about \$2.8 billion. But according to the Time Use Survey, 183 million hours were spent on renovation work to the house and garage in 1992, virtually all done by homeowners.² Valued at \$10 an hour, this work translates into \$1.8 billion, and at \$15 an hour,

into \$2.7 billion. The time spent doing renovation work, estimated through a completely independent survey, is consistent with the amount reported in the HRRES for direct purchases of materials, excluding taxes. In other words, if homeowners were purchasing materials for the contract work done under the table as well as for their own renovation work, reported purchases of materials would be much higher. The assumption of \$2.8 billion of unreported contract work is too high because it is inconsistent with the amount reported as purchases of materials.

The fact that contract work done under the table may be on the increase need not imply that underreporting to the survey is on the increase. One suspects that if it were, the proportion of homeowners reporting purchases of materials or the ratio of these purchases to total spending would be getting higher, but they are not, as shown in Table 3. The overall decline in the proportion of homeowners reporting any spending coincides with the recession and with the higher relative price of renovations attributable to the introduction of the GST. A good portion of spending on renovations is discretionary and can be postponed. But let us assume for a moment, as we have done earlier, that this decline cannot be taken at face value and reflects an increase in non-reporting due to growing underground activity. Then 40% of households, roughly the same proportion as in 1987, 1988 and 1989, could be expected to spend some amount instead of 35.5%. The total spending of these additional 296,000 households, at an average of \$4,460, would amount to \$1,320 million in 1992. The \$1,438 million estimated above does indeed appear to be an upper limit.

Estimates of spending on renovations by cottage owners are based on the Famex and projected on building permits for intervening years. The amount reported in the 1992 Famex under that heading (yet to be incorporated in GDP) is \$777 million. As the HRRES and the Famex are similar household surveys, the downward bias in the results, if any, should also be similar. Therefore under the same assumptions as above (20% underreporting of the same share of contract work to total spending), the underestimation would amount at the most to \$104 million.

In the case of spending on renovations in rented dwellings (by landlords and tenants), there is a measurement problem due to lack of information, not in itself related to underground activity. A benchmark was established years ago on the basis of information from a US survey and the input-output tables and has

1. Moreover, the relationship between the two is remarkably constant, yet the figures come from two independent surveys, the annual HRRES and the monthly Building Permits Survey:

	1988	1989	1990	1991	1992
	\$millions				
Renovation building permits	1,911	2,137	2,208	1,997	2,021
Homeowner renovations	10,477	11,370	10,861	9,753	10,420

2. This yields about 30 hours per homeowner per year, or 90 hours per year for each homeowner who reported some spending on renovations. Close to 1 billion hours were spent on doing interior and exterior repair to the house. See *Initial Data Release from the 1992 General Social Survey on Time Use*, uncatalogued document.

Table 3. Homeowner Expenditures on Additions, Renovations and New Installations

	1987	1988	1989	1990	1991	1992
1. Purchase of materials (\$millions)	2,775	2,754	3,140	2,831	2,620	2,810
2. Contract work (\$millions)	4,480	4,819	634	6,132	5,257	5,620
3. Total spending (\$millions)	7,255	7,573	9,484	8,963	7,877	8,430
4. Purchase of materials / total spending, in %	38.2	36.4	33.1	31.6	33.3	33.3
5. % of households reporting purchase of materials ¹	27.2	26.8	26.9	24.3	23.8	23.8
6. % of households reporting contract work ¹	21.0	20.8	21.4	20.8	18.7	18.0
7. % of households reporting any spending ¹	40.0	39.1	40.3	38.5	35.9	35.5

Note 1: The percentages in lines 5 and 6 do not add up to those in line 7 because some households report spending on both materials and contract work.

Source: *Homeowner Repair and Renovation Expenditure in Canada*, Catalogue No. 62-201, Table 1.

been projected since on building permit values for apartments. On the one hand, some landlords will abstain from getting a permit or understate their costs to avoid paying higher property taxes. On the other, substantial renovations in large apartment buildings could hardly be made without a permit. The spending is also tax deductible and serves to justify rent increases. Finally, some capital improvements not requiring a building permit, such as replacement of major appliances, will automatically be captured in GDP, perhaps as current expenditure instead of investment. For the sake of argument, an upward adjustment of 10% on account of underground transactions will be taken as an upper limit here, yielding \$153 million in 1992.

The underground transactions related to home renovations possibly escaping measurement in the official GDP could thus add up to \$1,695 million in 1992: owner-occupied housing, \$1,438 million, cottages, \$104 million, and rented housing, \$153 million. This amount, combined with the possibly missing transactions in new construction (\$1,883 millions), would raise by \$3.6 billion, or 11.6%, the published estimate of \$30.9 billion for residential construction excluding GST and transfer costs (Table 1, line 12), to a total of \$34.5 billion.

As purchases of building materials are well captured and their estimation is not affected by underground activity, this hypothetical level of \$34.5 billion would bring down the ratio of building materials to output from .490 to .439 in 1992, a low 'proxy' ratio in historical terms, much lower than in the period from 1985 to 1988 in which underground transactions were purportedly not so widespread. It would imply that the production function for construction has changed significantly, that wages and profits now constitute a larger share of total costs than in the mid-eighties. Since technological change is only gradual and the

economy, moreover, is going through a recessionary period, this is unlikely.

If all of the \$3.6 billion that may escape measurement corresponded to value added (that is, consisted solely of wages and profits, a very plausible assumption), unmeasured value added in residential construction would represent 40% of the recorded value added of \$9.0 billion (1.5% of GDP at factor cost in current dollars).¹ Undeclared value added in residential construction would amount to \$5.9 billion (\$3.6 billion unmeasured, and \$2.3 billion already captured, if one uses the 1991 figure shown in Table 2 as a proxy for 1992), and reach 47% of the true value added of \$12.6 billion (\$9.0 plus \$3.6). These figures must therefore be considered an upper limit.

2.3 Transfer costs

The last component of investment in residential construction is transfer costs related to the resale of dwellings, such as GST, land transfer taxes and real estate commissions. Only the latter, which make up over 80% of the total, are of concern here, the other components being indirect taxes.

It would be difficult for real estate agents to earn commissions 'under the table' without the knowledge of the firm employing them or for large real estate firms to hide transactions or understate commissions. The industry is self-regulated and is monitored by the provincial governments through the land registry system. Moreover, success in real estate is measured by the number and value of properties sold. Real estate agents tend to advertise rather than hide their results. Some firms and agents may still omit declaring part of their income to Revenue Canada.

1. See Part IV, section 1, and Table 20.

In any case, national accounts estimates of commissions do not rely on taxation data. They are derived with statistics supplied by the Canadian Real Estate Association, by applying an average commission rate to the reported value of sales. In the absence of direct information on commissions actually received and because the extent of commission discounting is not known, estimates in this area may be on the high side. As a matter of fact, the estimated amounts are usually higher than commission income reported by real estate agencies, real estate operators and trust companies. There are assuredly problems with respect to the measurement of real estate commissions, but none linked to the presence of underground transactions in the real estate industry. It is unlikely that real estate commissions are understated at all in GDP due to hidden transactions, even though some commission income may be undeclared.

3. Personal expenditure on goods and services

Personal expenditure on goods and services accounts for about 60% of GDP. It is divided into four broad categories by type of expenditure, durable goods (vehicles, furniture, appliances...), semi-durable goods (clothing and footwear, household furnishings...), non durable goods (food, beverages and tobacco, motor fuels, energy...) and services (rent, restaurants, health, education, recreation, operating expenses of non-profit organizations¹...), subdivided into some 140 series at the most detailed level (shown in Appendix II along with the estimated underground transactions). These series are calculated quarterly and annually using a wide variety of sources including business and household surveys as well as administrative data. After a two year lag, the detailed estimates are reconciled at an intermediate level of aggregation (40 categories) with those derived from the input-output accounts, based on an approach equating supply and demand for each commodity.

Along with residential construction, sales to households are the other major area where underground transactions take place. Alcohol, tobacco and domestic services are examples of goods and services that can be purchased 'under the

table'. GDP could also be underestimated as a result of what is known as 'skimming' of receipts on the part of legitimate businesses. In relation to hidden transactions (sales under the table and skimming), personal expenditures fall into three categories: a) those where such transactions are absent; b) those where they have little or no effect on the estimation of GDP; and, c) those where they result in an underestimation of GDP (tobacco, alcoholic beverages, repairs, meals in restaurants, etc.).

Many goods and services cannot be purchased under the table and, as a rule, businesses selling or providing them do not understate their receipts either. This is the case for new motor vehicles, motor fuel, heating fuel, electricity, gas, water charges, medical and hospital care, telephone, postage, cable television, urban transit, tickets from the provincial lotteries, insurance... Non-profit institutions belonging to the personal sector (universities, labour unions, recognized churches, charitable organizations and health associations such as the Red Cross) are generally not involved in underground production. Their operating expenses may be imperfectly measured, but are not underestimated on account of hidden transactions. Finally, some expenditure items do not reflect monetary transactions at all: they are imputations accounting for non-market activities with a close parallel in the market economy (services of owner-occupied dwellings, farm products consumed directly on the farm and services rendered without specific charge by financial institutions). In total, these expenditures (categories denoted by an 'A' in Appendix II) amounted to \$181 billion, or 46% of personal expenditure (excluding GST and provincial sales taxes) in 1992, leaving only 54% as subject to underestimation due to underground transactions.

The two primary examples of hidden transactions with little or no effect on GDP are covert rentals, already alluded to, and barter. It is not clear if the barter of goods and services is subject to GST and thus if it constitutes a form of tax evasion.² In any event, the value of goods bartered in the open or under the table is not missing from GDP. In the case of homemade pastries being bartered for an oil change in a car for example, the purchases of oil and baking ingredients have already been recorded in GDP. All that might be missing is an imputation of the mark-up or value added in production, based on the earnings arising from the two equivalent market transactions, namely

1. In the national accounts, the personal sector is defined to include persons, households, non-profit organizations, private pension plans and the investment income of life insurance companies.

2. An occasional exchange of homemade goods between neighbours is not likely ever to be treated as income in kind by Revenue Canada, but a systematically organized barter of services through a computer network might.

the sale of pastry and the provision of an oil change. But there is no such mark-up. The exchange is made on the basis of fair value. If value added were to be imputed in GDP in this instance, the oil and baking ingredients already recorded in personal expenditure would be treated as intermediate inputs in the production process instead, and deducted to avoid double counting.

Furthermore, since household production is left out of GDP (except for services provided by paid domestic help), the value added that could in principle be imputed to bartered homemade goods and household services should also be left out.¹ Only the value of other services bartered under the table could be deemed missing and it would be statistically negligible: one million barter exchanges a year, say, of car repairs for legal counselling or dental care (provided that the mechanic was willing to wait to be 'compensated' until he needed the services of a lawyer or a dentist), worth \$1,000 each, would add up to \$1 billion, about 0.1% of GDP.

Covert dwelling rentals are those from which the income is undeclared and they definitely constitute underground production. However, as rents are attributed to the total stock of dwellings, rented and owner-occupied, any increase in paid rents resulting from the 'finding' of hidden rentals is offset by a roughly equivalent drop in imputed rents. Rents, and GDP, will only be underestimated when the stock of dwellings itself is undercounted as a result of landlords 'hiding' apartments. The net effect on rents of these hidden dwellings is estimated below.

Except for rents, underground transactions will generally result in some underestimation of GDP without any offset. The problem is likely more serious for services. Goods are 'visible' (import duties and GST on purchases, invoices, inventories), whereas services are not. As a rule also, statistical coverage is less extensive for services, and independent data sources on supply and demand do not always exist. This lack of information, combined with the fact that the output of many services is purchased almost entirely by households at the final demand level, makes underground transactions in services very

difficult to detect even through the commodity flow balancing approach used in the input-output system.

From here on, given the scope and the sheer number of expenditure categories, we will proceed differently, without describing how the national accounts estimates are put together unless necessary. Potential skimming of business receipts in retail trade and services will be estimated first. To this will be added separate estimates for certain categories of expenditure, which would not have been covered under the heading of skimming. They will be presented roughly in declining order of importance. All estimates are without GST and provincial sales taxes, and should be interpreted as an upper limit of what could be missing from GDP on account of underground transactions.

3.1 Skimming

The phenomenon known as 'skimming', whereby legitimate businesses fail to declare a part of their business income, and presumably do not report it to Statistics Canada either, has probably always existed. Businesses engaged in skimming are not necessarily operating underground like smugglers, and often do so without the knowledge of their customers. But skimming does constitute tax evasion, and can lead to an underestimation of GDP *at the margin*, so it must be considered here.

The qualification 'at the margin' is important. A business may avoid declaring some receipts, but will likely be detected if it hides too much income, in relation to its operating costs or in comparison to other businesses. Similarly, in the national accounts, since the total supply of a commodity is made equal to the total demand for it through the input-output tables, a large and systematic underreporting of sales would also be detected and corrected.

Let us consider the example of household furniture retailing and assume for simplicity that there is no household furniture wholesaling.² As the manufacturing, imports and exports of household furniture are reliably measured, if household furniture retailers in the aggregate were understating their sales by too much, say 25%, total demand (retail sales plus exports) would be much lower than total supply (production plus imports plus margins). Part of

1. The point is the following. There are some good arguments for broadening the definition of GDP to include household production. However, this is a separate issue. According to the United Nations System of National Accounts, household production is **not** to be included in GDP. This means that no value added should be imputed in the case of exchanges of homemade goods or household services.

2. The example is hypothetical, like most others throughout the paper. It should not be construed as implying that furniture retailers are more likely to skim than other retailers, or even that they are necessarily skimming at all.

the imbalance could be resolved by increasing inventories, but only up to a point. If business were flourishing (other sources like the Famex may confirm the higher demand) and estimates on the supply side were believed to be reliable, the imbalance would be corrected by increasing domestic sales or inventories on the demand side rather than by recording a loss for the industry as a whole on the income side. In this instance, balanced version II in the table below would likely be adopted because it is more realistic.

Such imbalances are a common occurrence in the construction of input-output tables. Most of them reflect errors of transcription or tabulation, and problems of classification, valuation, timing or coverage affecting the estimates both on the demand and the supply side. The cross-checking inherent in the approach yields sound results, notably for goods, and helps to resolve some inconsistencies, but not all. A small average underreporting of sales could easily go undetected, and result in the estimation of a lower surplus or higher inventories than would otherwise be the case.

Hypothetical case of domestic sales underreported by 25%

1. Statistics originally recorded:			
Production	100	Exports	10
Imports	30	Domestic sales	100
Transport margin	10	Inventories	15
'Normal' retailers' profit	10		
Total domestic supply	150	Total demand	125
2. Balanced supply and demand - version I:			
Production	100	Exports	10
Imports	30	Domestic sales	100
Transport margin	10	Adjusted inventories	25
Retailers' profit	-5		
Total domestic supply	135	Total demand	135
3. Balanced supply and demand - version II:			
Production	100	Exports	10
Imports	30	Adjusted domestic	
Transport margin	10	sales	125
Retailers' profit	10	'Normal' inventories	15
Total domestic supply	150	Total demand	150

How widespread is skimming? Is it on the increase? This can only be determined through audits conducted by the tax authorities over many years, to which Statistics Canada does not have access. Electronic cash registers could serve to limit this kind of fraud. The introduction of the GST was also meant to make it more difficult, or at least less attractive for businesses selling goods, who need to collect GST on their sales to credit against GST paid on their intermediate purchases. For businesses in services

making few intermediate purchases on the other hand, the introduction of the GST could have been an incentive to do the opposite, that is, to conceal an even greater proportion of receipts. Self-employed individuals without paid employees and small businesses with very few employees are obviously in a better position to engage in skimming.

All understatement of business receipts does not necessarily translate into an underestimation of GDP. Of concern is skimming by businesses selling to households. Businesses selling to other businesses (intermediate demand) rather than households (final demand) may also engage in skimming. However, at the intermediate level, the practice is probably much less common, because one firm's revenue is the other one's expense, and that other firm needs a receipt for its accounts. More fundamentally, even if that firm does not enter its purchases made under the table from other firms in the books, it will nevertheless somehow pass on all its costs (in the books and off the books) to its customers. The market price of goods and services sold to consumers automatically embodies all the skimming that may have gone on at the intermediate level. *Intermediate skimming is not missing in GDP any more than intermediate sales.* If it were to be treated as missing production and added to the total, part of the economic production would be counted twice, or more. Only skimming of receipts by businesses selling to households can lead to an underestimation of GDP and need be estimated.

Moreover, it is extremely unlikely that large businesses engage in skimming at all. It would be very complicated, if not impossible, for large retail organizations, often provincial or national in scope, with hundreds or thousands of employees, to do so. The damage to their reputation, should the fraud be discovered would be far greater than any benefit they may gain from it. One may safely assume that skimming of receipts is limited to small businesses.

In order to estimate how much the skimming of receipts can possibly amount to, we assume an average underreporting of 25% of gross receipts in services, and 15% for taxicabs and most of retail trade (25% for vending machine operators, direct sellers and repair shops, classified to retail trade). Department stores are deemed not to be skimming at all. So are liquor, wine and beer stores: liquor stores are government-owned, and the sale of wine and beer is regulated. No skimming is calculated for goods and services a) which are not subject to underground transactions, or b) for which a separate estimate of underground transactions is made elsewhere, to avoid double counting.

Relevant examples of the first case are newspaper and magazine subscriptions (to the Globe and Mail, La Presse, Maclean's, etc.), new motor vehicles and motor fuels. Thus, for new motor vehicle dealers, skimming is calculated on receipts excluding new motor vehicle sales. Service stations cannot hide their motor fuel receipts from oil companies, who duly report sales to Statistics Canada. The assumed percentage of skimming is applied only to the remainder of service station receipts.¹ A good example of the second case is that of mobile home dealers for which skimming was in effect already estimated under the heading of residential construction (in section 2.1 above). The same goes for vending machine operators selling cigarettes: legal and contraband sales of tobacco are fully accounted for through other sources (see the next section). Potential skimming by professionals is dealt with separately, in section 3.6.

Strictly speaking, the skimming percentages should have been applied, in all instances, to the portion of receipts coming from sales to households, not from sales to businesses, as 'intermediate' skimming, just like intermediate sales, is already captured in GDP. This is done in only two cases (taxicabs and motor vehicle rental and leasing) where over 50% of receipts come from sales to other businesses and governments. The omission of this adjustment implies an overstatement of the estimates in relation to GDP. In other words, had the proper adjustments been carried out systematically, the resulting estimates would have been lower (notably for hotels and restaurants). The aim being to estimate an upper limit, this small overstatement is of no consequence.

'Small' businesses are defined to include incorporated businesses with annual sales up to \$1 million and all unincorporated businesses, even those with annual sales above \$1 million. Calculations are done at the four-digit level of the Standard Industrial Classification, on the basis of annual sales declared to Revenue Canada. The required data for all businesses, incorporated and unincorporated, are taken from the 1992 taxation data files. The results by kind of business (shown in Table 4) are then distributed by commodity using all the available information, such as the 1989 Retail Commodity Survey. These detailed estimates by category of spending are presented in Appendix II.

1. That is not to say that motor fuel taxes are paid in their entirety. Again, there may be tax evasion where there is no underground production.

The figure of \$132 billion for total retail sales (all firms) appearing in Table 4, as explained, excludes all receipts of department stores, liquor, wine and beer stores and mobile home dealers, as well as some of the receipts of new motor vehicle dealers (from new cars and trucks) and service stations (from motor fuels). The inclusion of these brings the total to \$184 billion, very close to the comparable figure of \$185 billion reported in the Retail Trade Survey for 1992.²

Under these assumptions, skimming by small businesses selling to households could have amounted to \$10,836 million in 1992, or 2.8% of personal expenditure (without GST and provincial sales taxes) and 1.6% of GDP. The implicit proportion of skimming for retail trade and services combined is 19.6%. These results should be considered an upper limit for several reasons. First, as the name indicates, skimming occurs at the margin. Unless retailers can also hide costs (rent, salaries, cost of goods purchased for resale), they will be unable to hide more than a fraction of their receipts without declaring a loss.³ And they cannot declare phoney losses and stay in business without alerting tax auditors. Businesses in services can more easily hide a higher proportion of receipts, thus the higher skimming percentage adopted, but would still have to hide a significant proportion of costs not to arouse suspicion.

The annual sales threshold adopted here for small incorporated firms (all unincorporated firms are in the universe, regardless of sales) covers businesses with several employees, perhaps as many as ten or more if employed part time. A business owner wishing to hide receipts would likely have to involve some of his employees in the conspiracy, which would be a complication, if not a deterrent. If the aim were to produce a plausible estimate, rather than an upper limit, the annual sales threshold would have to be extended to unincorporated firms or even lowered altogether in order to capture only firms with a very small number of employees.⁴

2. The monthly Retail Trade Survey (Catalogue No. 63-005) collects information from all department stores and a sample of the other stores. The 1992 taxation data files contain the sales declared by all businesses for the fiscal year ending in 1992.

3. In a limited number of instances, the skimming is facilitated because the hidden costs are ones incurred 'under the table'. Examples are contraband spirits or stolen car parts purchased for resale and wages paid to illegal immigrants.

4. Some may argue, on the contrary, that the threshold of \$1 million in annual sales adopted for incorporated firms is too low. The calculations done taking into account firms with sales up to \$2 million yielded an estimate for skimming \$3 billion higher, a significant amount but still less than 0.5% of GDP.

Table 4. Potential Skimming of Receipts by Small Businesses Selling to Households, 1992

Kind of business	All firms	Gross receipts			Skimming of receipts by small firms			
		Small firms			High assumption		Low assumption	
		All	Incorp.	Uninc.				
		millions of dollars			%	\$M	%	\$M
Supermarkets	30,830	1,989	1,589	400	15	298	10	199
Grocery stores	11,702	5,260	1,707	3,553	15	789	10	526
Other food stores	2,754	1,829	678	1,151	15	274	10	183
Pharmacies and patent medicine stores	10,162	1,033	857	176	15	155	10	103
Shoe, apparel and fabric stores	9,984	2,839	2,167	672	15	426	10	284
Household furniture stores	3,663	729	613	116	15	109	10	73
Appliance, TV, radio and stereo stores	3,846	1,021	788	233	15	153	10	102
Household furnishings stores	2,254	973	769	204	15	146	10	97
Motor vehicle dealers (excl. new cars and trucks)	10,797	1,220	592	628	15	183	10	122
Recreational vehicle dealers	1,983	561	394	167	15	84	10	56
Service stations (excl. gasoline)	2,292	1,150	395	755	15	172	10	115
Auto parts and accessories stores	5,179	985	838	147	15	148	10	99
Motor vehicle repair shops	6,253	4,299	2,884	1,415	25	1,075	15	645
Motor vehicles services	722	397	275	122	25	99	20	79
General stores and general merchandise stores	7,068	1,363	489	874	15	204	10	136
Book and stationery stores	2,145	575	388	187	15	86	10	57
Florists, lawn and garden centres	922	649	435	214	15	97	10	65
Hardware, paint, glass and wallpaper stores	3,571	1,355	1,060	295	15	203	10	136
Sporting goods and bicycle shops	1,985	1,011	751	260	15	152	10	101
Musical instruments and record stores	807	302	217	85	15	45	10	30
Jewellery stores	1,052	640	493	147	15	96	10	64
Camera and photographic supply stores	570	215	137	78	15	32	10	21
Toy, hobby, novelty and souvenir stores	1,591	845	510	335	15	127	10	84
Other stores, excl. second-hand and mobile home	6,605	3,262	1,922	1,340	15	489	10	326
Appliance, shoe, jewellery and furniture repair	821	645	380	265	25	161	15	97
Vending machine operators and direct sellers	2,672	1,788	1,041	747	25	447	20	358
Sub-total, retail trade	132,230	36,935	22,369	14,566	16.9	6250	11.3	4,158
Taxicabs	284	201	72	129	15	30	10	20
Transport (moving and storage, sightseeing, parking)	1,598	264	228	36	25	66	20	53
Child day-care and day nurseries	652	547	351	196	25	137	20	109
Other education (driving schools, language schools...)	341	211	160	51	25	53	20	42
Hotels and motor hotels	4,174	896	593	303	25	224	20	179
Motels, cabins, guest houses, camping grounds....	1,611	824	590	234	25	206	20	165
Licensed restaurants	7,122	3,279	2,627	652	25	820	20	656
Unlicensed restaurants, take-outs and caterers	10,961	5,573	3,833	1,740	25	1,393	20	1,115
Taverns, bars and night clubs	1,492	945	775	170	25	236	20	189
Amusement services	3,124	1,361	1,122	239	25	340	20	272
Barber and beauty shops	1,669	1,493	653	840	25	373	20	299
Laundries and cleaners	1,390	699	486	213	25	175	20	140
Other personal services	1,528	778	608	170	25	195	20	156
Vehicle rental and leasing	1,519	239	188	51	25	60	20	48
Photographers	457	317	192	125	25	79	20	63
Other repair services and services to buildings	1,409	797	491	306	25	299	20	159
Total, retail trade and services	171,561	55,359	35,338	20,021	19.6	10,836	14.1	7,824

Incorp.: Incorporated firms

Uninc.: Unincorporated firms

Sources: Business Register Division, taxation data files, and National Accounts.

Table 5. Potential Skimming of Receipts Expressed as a Percentage of Net Income

	Retail trade		Services	
	1990	1991	1990	1991
1. Declared gross receipts (\$millions)	18,225	17,898	12,545	13,732
2. Skimming in % of declared gross receipts	15	15	25	25
3. Skimming (\$millions) 1 * 2	2,734	2,685	3,136	3,433
4. Declared net income (\$millions)	1,243	1,145	2,678	2,816
5. 'True' net income (\$millions), 3 + 4	3,977	3,830	5,814	6,249
6. Skimming in % of true net income, 3 / 5	69	70	54	55
7. 'True' gross receipts (\$millions), 1 + 3	20,959	20,583	15,681	17,165
8. True net income in % of true gross receipts, 5 / 7	19.0	18.6	37.1	36.4
9. Declared net income in % of declared gross receipts, 4 / 1	6.8	6.4	21.3	20.5

Source: Lines 1 and 4: Revenue Canada, *Taxation Statistics*, Table 9.

More importantly, not all businesses engage in this type of fraud. If as many as 50% did, the implied skimming would be 30% of gross receipts in retail trade and 50% in services. Even if all small firms were defrauding, the skimming percentages adopted are extremely high, if not completely unrealistic. This becomes readily evident when the skimming is expressed as a percentage, no longer of gross receipts, but of 'true' net income, defined as the declared net income plus the hidden receipts, as is done in Table 5.¹ The conclusions that emerge from the table are valid for all small businesses (and for large ones as well), since profit margins are not dramatically different between the various types of business (small or large, incorporated or not, selling to households or to other firms). *The skimming percentages adopted would imply, if true, that all small businesses are hiding at the minimum 50%, perhaps as much of 70%, of their 'true' net business income.* The true margin on gross receipts would be 19% in retail trade (instead of the declared margin of 6-7%), and 37% in services (instead of the declared margin of 20-21%). Some small businesses undoubtedly succeed in hiding such a proportion of their income, but not all of them.²

1. The figures are taken directly from the *Taxation Statistics* for illustrative purposes, and pertain only to unincorporated firms. Thus the universe is smaller than in Table 4, but the coverage is broader, since business services (such as accounting, advertising, consulting and engineering services, computer services and machinery and equipment rentals) are also included under 'services'.

2. Some who operate entirely underground even manage to hide it all. But firms with no business address, no advertising except by word of mouth and offering no guarantee whatsoever are not likely to attract many customers.

These assumptions were adopted here for the sole purpose of estimating an upper bound to underground transactions and their impact on GDP. Even lower assumptions for skimming of gross receipts of 10% in retail trade (except 15% for repair shops) and 20% in services, the results of which are also shown in Table 4 for the sake of comparison, would entail that all small businesses are hiding about 50% of their net income. *The results should not be construed in any way as implying that all small businesses are defrauding, let alone in these proportions.* If skimming were that easy, and true margins on gross receipts that high, thousands of small businesses would not be going bankrupt every year.

3.2 Tobacco

The phenomenon of tobacco smuggling has received so much attention recently that little elaboration is required here. Canadian cigarettes manufactured and exported legally are being smuggled back into the country. All transactions relating to the legal manufacturing and export of tobacco products are captured in GDP. What presently escapes measurement, but will be incorporated at the time of the next revision of the national accounts in June 1994 (covering the period from 1990 to 1993), is the value of imports of, and personal spending on, contraband cigarettes on the expenditure side of GDP, and the net income they give rise to on the income side. These estimates go back to 1987 and are calculated monthly in the national accounts, as follows.

Exports of cigarettes are assumed to have been at a normal level in 1986, that is, one which did not reflect any smuggling. After that date, when legal exports start picking up, the 'normal' level of exports is set as

Table 6. Legal and Estimated Contraband Sales of Canadian Cigarettes, in Volume

	1986	1987	1988	1989	1990	1991	1992	1993
	billions of cigarettes							
1. Legal sales	63.6	61.1	60.3	56.4	52.9	46.7	41.3	34.8
2. Estimated contraband sales	0	0.6	0.6	1.3	1.8	6.6	9.8	15.6
3. Total consumption	63.6	61.7	60.9	57.7	54.7	53.3	51.1	50.4
4. Market share of contraband, in %	0	1.0	1.0	2.3	3.3	12.4	19.2	31.0
5. Index, legal sales, 1986 = 100	100	96.1	94.8	88.7	83.2	73.4	64.9	54.7
6. Index, total consumption, 1986 = 100	100	97.0	95.8	90.7	86.0	83.8	80.3	79.2

Source: National Accounts.

Table 7. Effect on GDP of Underground Transactions Related to Tobacco, 1992 and 1993

Income-based GDP			Expenditure-based GDP		
	1992	1993		1992	1993
	millions of dollars			millions of dollars	
Net income, smuggler mark-up	423	747	Personal expenditure, contraband	1,057	1,868
			Change in inventories, contraband	-15	-26
			Contraband imports	-619	-1,095
Gross Domestic Product	423	747	Gross Domestic Product	423	747

Source: National Accounts.

the same percentage of the total production of cigarettes as in 1986. Broadly speaking, the gap between the 'normal' volume and the actual volume of exports constitutes the estimated volume of cigarettes entering the country in contraband. This volume is then valued at black market prices and at import prices, the gap between the two being equal to the smuggling mark-up.¹ Legal and estimated illegal sales of Canadian cigarettes in volume are reproduced in Table 6. The effect of tobacco smuggling on GDP in 1992 and 1993 appears in Table 7.

Included in the volume and value of the legal and estimated contraband sales are not only manufactured cigarettes, but also the fine cut tobacco made into cigarettes.² These estimates are reliable and can be considered complete. If anything, they are on the high side, particularly for 1993. The implied average price per contraband carton is \$21.57 for 1992 and \$23.95 for 1993, while some smugglers were selling a carton for as little as \$17 or \$18 toward the end of 1993. The value of smuggled foreign cigarettes and of the ones illegally manufactured in Canada, if any, is not included here.

1. In reality, contraband cigarettes are not all resold in the same month in which they enter the country and smugglers have inventories, just like other retailers. The smugglers' margin is therefore equal to their sales, less imports, less the change in their inventories.

Legal imports of American cigarettes have always been small, measured in millions rather than billions, and have also been dropping in the past few years. Seizures made by the police are evidence that American cigarettes are being smuggled into the country. As an upper limit, one may assume that, unlike total consumption of domestic cigarettes, consumption of American cigarettes should have remained at its peak level of 1988, and that legal imports since then would have been replaced by contraband products.³ For 1992, this would yield 1.1 million cartons which, valued at \$25, would fetch \$27 million on the black market. Comparable figures for

2. The conversion factor for the fine cut tobacco is one gram per cigarette. In the preliminary version of the study, the volumes pertained only to manufactured cigarettes. The inclusion of fine cut tobacco, mostly sold legally, in the total gives a truer picture of tobacco consumption. In addition, the estimated volume of contraband is no longer based on total Canadian exports of tobacco, but only on exports to the United States, since the latter are the ones re-entering the country in contraband. This led to a downward revision of about 15% in the estimated contraband volume for 1993.

3. Estimated contraband sales of American cigarettes:

	1986	1987	1988	1989	1990	1991	1992	1993
1. Legal imports (millions)	499	417	500	393	232	346	284	241
2. Estimated 'normal' imports (millions)	499	417	500	500	500	500	500	500
3. Estimated contraband imports, 2-1	0	0	0	107	268	154	216	259
4. Contraband (L3), in thousand cartons	0	0	0	535	1,340	770	1,080	1,295

1993 are 1.3 million cartons and \$32 million. In all likelihood, smuggling of American cigarettes existed prior to the large drop observed in legal imports in 1989. This 'base level' of smuggling is not included in the above figures, and Statistics Canada has no way of estimating it. The same goes for the value of illegally manufactured cigarettes which, judging by anecdotal evidence, would be extremely small. The figures shown in Table 7 are thus an upper limit only for Canadian cigarettes imported illegally.

It is interesting to note that the 1992 Famex survey was the first opportunity to observe whether smuggling, by then a widespread phenomenon, would make respondents more reluctant to report their spending. In household surveys in general, spending on tobacco and alcoholic beverages is always understated, much lower than recorded legal sales in fact. The ratio of spending on tobacco as measured in the Famex to that recorded in GDP was .705 in 1969, .720 in 1978, .694 in 1982, .712 in 1986 and jumps to .815 in 1992. If one adds to the legal spending on tobacco of \$9,848 million recorded in GDP for 1992 the spending on contraband tobacco, presently estimated at \$1,057 million, the ratio drops to .736, but is still higher than in the four previous surveys. The existence of contraband did not lead respondents to hide their purchases, quite the contrary. Some probably valued them at legal prices instead. Black market transactions here appear to have resulted in more spending being reported, not less.

3.3 Alcoholic beverages

Underground transactions in this area are the illegal manufacturing of wine and the smuggling of spirits. Lower taxes and higher transportation costs make the smuggling of wine and beer unprofitable. Contrary to cigarettes, the smuggled spirits are not generally produced in Canada and therefore the volume estimates of the contraband are more speculative. The same is also true of illegally manufactured wine. For illustrative purposes, we will assume that the figures put forward by the LCBO and the Association of Canadian Distillers (ACD), very close to one another, are accurate and constitute an upper limit of what is imported or manufactured illegally.

Illegally manufactured wine is apparently sold in various retail outlets and not all consumed as a beverage, but rather extensively used in cooking. A portion may also be sold in restaurants as 'house wine'. The LCBO pegs its loss on this account at \$320

million in the fiscal year ending March 31, 1994 (calculated as 40 million litres sold at an average legal price of \$8.00 a litre). As the purpose is to estimate an upper limit to underground transactions, the same volume will be deemed sold at the same price in 1992. At a black market price of \$4.80 a litre (60% of the legal price), this would represent \$192 million. If the phenomenon is as common in other provinces, the corresponding figures for Canada, on the basis of population (Ontario's share is 37.3%), become 107 million litres and \$515 million.¹

For the smuggling of spirits, the LCBO forecast is 19.1 million litres at an average legal price of close to \$26 a litre, for a total value of \$496 million in 1993-94. According to the ACD, 4 million cases of spirits (or 36 million litres, at 12 bottles of 750 ml a case) enter Canada illegally every year, of which half, or 18 million litres, are sold in Ontario alone. Always with the upper limit in mind, the 6% higher LCBO estimate will serve as the basis for the calculations, and the assumptions made for wine will apply, namely: the same volume and price in 1992 as in 1993,² and a contraband as widespread in the rest of the country, in other words, Ontario accounts for only 37.3% of it, not for 50% as claimed by the ACD. This yields for Canada as a whole an estimated smuggled volume of 51.2 million litres which, at an average price of \$15 a litre (57.7% of the average legal price of \$26 a litre in Ontario), would have fetched some \$768 million on the black market in 1992. The average black market price of \$15 a litre is on the high side, smugglers selling a carton of cigarettes for as little as 40% of the legal retail price (\$18/\$45).

1. Throughout this section, illegal volumes estimated for Ontario are blown-up for Canada on the basis of population rather than volume of legal sales to avoid any distortion resulting from underground transactions themselves. For example, Ontario's share of legal sales of wine was 33.9% in 1991-92 (*The Control and Sale of Alcoholic Beverages in Canada*, Catalogue No. 63-202). On that basis, the estimated volume of 40 million litres translates into 118 million instead of 107 million for Canada. If Ontario's share of the illegal market were 50%, as claimed by the ACD about spirits (LCBO report, *op. cit.*), the corresponding volume for Canada would drop to 80 million litres.

2. The ACD claims that smuggling has been at a high level for some years. The LCBO, on the contrary, says that contraband is escalating rapidly, citing as evidence a substantial increase in seizures over the past year. If the phenomenal growth of tobacco smuggling in Canada in 1993 (the national accounts estimates show an 60% increase in volume) had any spillover effect, alcohol smuggling probably increased in 1993. The assumption of the same contraband volume in 1992-93 than the LCBO forecast for 1993-94 likely implies an overstatement for 1992-93.

Table 8. Legal and Estimated Contraband Sales of Spirits, in Volume

	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93
	millions of litres							
Ontario:								
1. Legal sales	62.6	63.9	67.2	67.2	63.9	59.7	55.4	50.5
2. Estimated contraband sales	n/a	n/a	n/a	n/a	n/a	n/a	n/a	19.1
3. Total consumption	n/a	n/a	n/a	n/a	n/a	n/a	n/a	69.6
4. Market share of contraband, in %	n/a	n/a	n/a	n/a	n/a	n/a	n/a	27.4
5. Index, legal sales, 1985-86 = 100	100	102.1	107.3	107.3	102.1	95.4	88.5	80.7
Canada:								
6. Legal sales	164.8	160.7	161.8	159.9	153.7	145.1	136.8	126.0 ¹
7. Estimated contraband sales	n/a	n/a	n/a	n/a	n/a	n/a	n/a	51.2
8. Total consumption	n/a	n/a	n/a	n/a	n/a	n/a	n/a	177.2
9. Market share of contraband, in %	n/a	n/a	n/a	n/a	n/a	n/a	n/a	28.9
10. Index, legal sales, 1985-86 = 100	100	97.5	98.2	97.0	93.3	88.0	83.0	76.5

n/a Not available

Note 1: This is an estimate for 1992-93, based on figures reported by Quebec, Ontario, Alberta and British Columbia.

Sources: LCBO and *The Control and Sale of Alcoholic Beverages in Canada*, Cat. No. 63-202.

Contraband alcohol is not all sold directly to consumers. Part of it finds its way behind the counter in bars and restaurants. The split between sales to consumers and those to licensees (licensed hotels, bars and restaurants) is not known. It can however be approximated. The LCBO estimates the volume of its sales of spirits to licensees at 7.6 million litres in 1990-91, 6.7 million litres in 1991-92 and 6.5 million litres in 1992-93.¹ If the estimate of 19.1 million litres of contraband liquor in Ontario is reasonable for 1992, it follows that only a fraction of it could be sold to licensees because the 'market' of licensees is too small to absorb any more. A licensee can perhaps easily dispose of contraband liquor, but he cannot replace a large portion of his legal purchases by contraband ones without arousing suspicion, and can only do so gradually. Overall, contraband sales to licensees in Ontario could probably amount at the most to 3 million litres, for a 30% (3/9.5) contraband share of the licensee market. This would leave 16.1 million litres sold directly to consumers in 1992, for roughly a 85%/15% split, say 80%/20% as an upper limit, between contraband sales to consumers and those to licensees, which applied to Canada as a whole would put the upper limit of contraband sales to licensees at \$154 million in 1992.

The licensee mark-up on that liquor, at around 300% in the upper range,² could add another \$462 million to personal expenditure under the heading of 'service portion of alcoholic beverages'. This would be close to an upper limit, not only in terms of mark-up percentage, but because some of that mark-up may

already be counted in GDP. If licensees report their total alcohol receipts, regardless of the source of supply, the mark-up on contraband alcohol will automatically be captured in GDP, even if the purchase of this alcohol is not, because it is calculated residually by deducting the legal purchases of licensees through liquor commissions. If this were the case, the measured margin would increase: not only is it higher for contraband alcohol, but the overall margin, both on legal and illegal purchases, is in effect calculated only in relation to legal purchases. This possibility should not be discounted: the average mark-up on alcohol sold by licensees, as calculated in the national accounts, did indeed go up, from 1.26 in 1988 to 1.40 in 1989 and 1.45 in 1990, which suggests that some of the mark-up on contraband alcohol is already captured in GDP.

Because taxes on wine are not as high as on spirits, the potential gains for licensees purchasing illegally manufactured wine are not as great. These products would also be in competition with inexpensive foreign wines. For this reason, we will assume that only 10% of the estimated illegal volume is sold to licensees, against 20% for spirits. The average mark-up would also be smaller, probably around 150%, and 200% in the upper range. Under these assumptions, the licensee mark-up on illegal wine would amount to \$103 million in 1992.

2. According to the national accounts, the average mark-up on alcohol sold in licensed outlets (including tips) was 145% in 1990, the last benchmark year. If one removes 10% for tips, the 145% mark-up becomes 132%, or \$34 on a bottle of liquor of \$26, for a total of \$60. If the contraband bottle bought at \$15 is sold at the same price, the mark-up is \$45, or 300%.

1. Figures from the Liquor Control Board of Ontario.

Table 9. Effect on GDP of Potential Underground Transactions Related to Alcoholic Beverages, 1992

Income-based GDP		Expenditure-based GDP	
	millions of dollars		millions of dollars
Net income, illegal wine	515	Personal expenditure, illegal wine	515
Net income, smuggler mark-up on spirits	384	Personal expenditure, contraband spirits	768
Net income, licensee mark-up on contraband spirits	462	Personal expenditure, licensee mark-up on contraband spirits	462
Net income, licensee mark-up on illegal wine	103	Personal expenditure, licensee mark-up on illegal wine	103
		Imports of contraband spirits	-384
Gross Domestic Product	1,464	Gross Domestic Product	1,464

The import value itself of the contraband liquor (i.e. its cost to the smuggler) would probably range anywhere from 40% to 60% of its black market value, and will be deemed equal to 50% here, or \$384 million in 1992. The higher the cost of importing to the smuggler in relation to the black market price of the alcohol, the lower the profit and the smaller the amount potentially missing from GDP. At the limit, as in the case of most cross-border purchases, there is no resale and thus no profit and no transaction is left unmeasured, as explained earlier.

The effect of all these mostly underground transactions (smuggled liquor can be sold openly in bars, customers not knowing its origin) on GDP, illustrated in Table 9, would be as follows. The sales of illegally produced wine, estimated at \$515 million, would result at the most in an increase of the same magnitude in personal expenditure and in net income of unincorporated business (and probably less because the purchase of wine-making ingredients and supplies would be deducted from personal expenditure and shifted to intermediate demand, thereby also decreasing net income). The black market sales of the smuggled liquor, estimated at \$768 million, would lead to an identical increase in personal expenditure, offset by a \$384 million increase in imports. To this should be added the licensee mark-ups, \$462 million on spirits and \$103 million on wine, for a net effect on GDP of \$1,464 million, or 0.2% of GDP in 1992. This would be balanced on the income side of GDP by an equivalent increase, most of which would probably be recorded under net income of unincorporated business.

The volume estimates of wine and spirits put forth by the LCBO likely represent an upper limit. Although the rationale behind the volume figures for wine is not known, they are extremely high. The 40 million litres for Ontario should be compared with total legal sales of domestic and imported wine of 78 million litres in 1991-92. This would imply a market share of 34% for illegal wine in Ontario. In other words, one in every three bottles of wine sold in that province would be of illegal provenance. There is very little evidence to

support this claim. Such volumes would make the illegal wine manufacturing business in Canada almost twice as large in value terms (\$515 million), as legal wine production in Canada. Commercial wineries had receipts of \$264 million in 1990 according to taxation data. Their shipments were \$291 million in 1992 (source: Survey of Manufacturing).¹

In the case of contraband liquor, forecast volume figures are based on the assumption that the steeper decline in legal consumption per capita in Ontario and Canada in comparison to the US can be largely attributed to contraband sales. Yet alcohol consumption patterns differ significantly between provinces. Why should they be the same in Canada and the US? Second, there is some price elasticity in the demand for alcohol (or tobacco), albeit perhaps not very large. The historically lower prices of alcoholic beverages in the US could account to some extent for a more moderate decline in consumption.

More importantly, the estimated spirit volumes imply a contraband share of the market that is too high in relation to the drop in legal sales. In the case of tobacco, legal sales had fallen by 45% in seven years before contraband captured about 30% of the market (Table 6). By comparison, legal sales of spirits have only dropped by 19% in Ontario, and 23% in Canada in the seven years from 1985-86 to 1992-93 (Table 8). It is virtually impossible for a drop in legal sales half as large for spirits (23%) as for tobacco (45%) in the same period to translate into a contraband market share almost as high for spirits (27% in Ontario and 29% in Canada) as for tobacco (31%), unless overall consumption of spirits had increased markedly or contraband had taken hold much earlier and had been at a high level for a long time.

Both these scenarios, however, contradict all the available evidence. The assumption of a marked increase in overall consumption of spirits is not plausible. Like the proportion of regular smokers, the

1. Legal and illegal sales of wine can be compared as both are valued without taxes.

proportion of current drinkers has dropped during the past fifteen years, and the volume of alcohol consumed has also declined. Such a decline in the per capita alcohol consumption has occurred in a number of industrialized countries.¹ There is every reason to believe that alcohol smuggling really escalated along with tobacco smuggling. In Ontario, legal sales of spirits dropped below their level of 1985-86 only in 1990-91. In many instances in the past few years, alcohol and cigarettes were seized together. The anecdotal evidence alone strongly suggests that the consumption of contraband spirits was not very important six or seven years ago, and certainly far less common than that of cigarettes in 1992 and 1993.

Finally, the estimates just calculated are also based on a worst case scenario: same volume in 1992 as in 1993, same penetration of contraband in the rest of the country as in Ontario, as well as a price, a share of sales to licensees and a licensee mark-up all on the high side and no part of this mark-up already counted in GDP in spite of indications to the contrary. For these reasons, these estimates must be considered an upper limit for 1992.

3.4 Rent, room and board

Because rents in GDP are calculated as the product of the average rent and the stock of rented dwellings, any undercount in the stock will lead to an understatement of rents. Such an undercount can be related to the underground economy when apartments are overlooked by census enumerators for the very reason that they were purposely hidden (dwellings with a concealed entrance, or no separate entrance for instance) by owners which rent them on the black market. How can the number of these purposely hidden rented dwellings be approximated?

Statistics Canada recently completed its verification of the 1991 Census results. Through a procedure known as a reverse record check, it was able to calculate a net undercount (undercount less overcount) of the population and of households. The number of missed households was estimated at 227,000, and the number of missed tenant households, the one relevant here, at 174,000.² Most of these households lived in dwellings which had

been properly enumerated, but erroneously classified as vacant. Although the number of dwellings truly missed was not verified directly (the verification procedure is designed to count persons, not dwellings), it is estimated to range between one quarter and one third of the number of missed households.

For the purpose of calculating the underestimation of rents on account of underground transactions, the number of purposely hidden rented dwellings was simply deemed equal to half of the estimated number of tenant households missed in the 1991 Census. This undoubtedly constitutes an upper limit. It is up to twice as many as the number of dwellings which Statistics Canada believes have been missed. Moreover, close to 40% of the missed households lived outside census metropolitan areas, where covert rentals would be infrequent. Finally, it is likely that a large number of dwellings were simply missed by error, while the assumption made here is that all were missed because they were purposely hidden.

The stock of hidden rented dwellings in 1991 was multiplied by an average rent set as an upper limit at 90% of the average space rent,³ to reflect the fact that these apartments are small and are usually rented below the market rate (a plausible assumption here would likely be less than 90% of the average rent). This yielded the potential underestimation of paid rents. However, these hidden rented apartments are located in houses erroneously enumerated as single dwellings or duplexes and counted in the stock of owner-occupied dwellings. The rent imputed to an owner-occupied dwelling in the national accounts is deemed equivalent to the average rent for a tenant-occupied dwelling, adjusted by a coefficient reflecting the difference in the average area of each type of dwelling. The space coefficient attributed to houses with a hidden apartment occupying the basement or the upper floor would have been too high, and their imputed rent should be reduced accordingly by about 30%, to derive the overestimation of imputed rents. What escapes measurement here, what would need to be added to GDP, is the difference between the underestimation of paid rents and the resulting overestimation of imputed rents. The calculations in Table 10 pertain to 1991 and are shown for Canada; the actual calculations were done by province and yielded a slightly higher result of \$211 million (\$437 million for paid rents, less \$226 million for imputed

1. See *Health Status of Canadians: Report of the 1991 General Social Survey*, Catalogue No. 11-612E, No. 8.

2. See *Coverage. 1991 Census Technical Reports*, Catalogue No. 92-341E.

3. Space rent excludes landlord expenses on utilities, janitorial services, etc. which are accounted for separately in personal expenditure. In recent years, it has been estimated at about 85% of gross rent.

Table 10. Potential Underestimation of Rents Due to Covert Rentals, 1991

1. Missed households (thousands)	227
2. Missed households living in rented dwellings (thousands)	174
3. Missed rented dwellings, 50% of L2 (thousands)	87
4. Average annual gross rent, (\$535 * 12) (dollars)	6,420
5. Average annual space rent, 85% of L4 (dollars)	5,457
6. Average annual space rent, covert rentals, 90% of L5 (dollars)	4,911
7. Paid rents, missed rented dwellings (\$million), L3 * L6	427
8. Average number of rooms, owner-occupied dwellings	7.0
9. Average number of rooms, rented dwellings	4.5
10. Rent blow-up factor, owner-occupied dwellings, L8 / L9	1.56
11. Average annual space rent imputed to owner-occupied dwellings, L5 * L10 (dollars)	8,489
12. Owner-occupied dwellings affected, repeat L3 (thousands)	87
13. Rents imputed to owner-occupied dwellings affected, L11 * L12 (\$million)	738
14. Corrected rents imputed to owner-occupied dwellings affected, 70% of L13 (\$million)	517
15. Overstatement of rents imputed to owner-occupied dwellings affected, L13 - L14 (\$million)	221
16. Net effect, i.e. effect on paid rents less effect on imputed rents, L7 - L15 (\$million)	206

Sources: 1991 Census for lines 1, 2, 4, 8 and 9; National Accounts for line 5.

rents), which was adjusted to a 1992 level by the increase in paid and imputed rents. The upper limit of what could be missing from GDP on account of covert rentals is \$220 million (\$454 million for paid rents, less \$234 million for imputed rents) in 1992, or 1.1% of paid rents.

This maximum net amount should not be confused with undeclared rental income, which could be much higher. The gap between national accounts estimates and amounts declared to Revenue Canada with respect to net rental income, shown in Table 17 below, has grown from \$573 million in 1988 to \$1,680 million in 1991. Not all of it should be attributed to tax evasion (through understatement of gross rental income or overstatement of expenses), on account of conceptual differences and measurement problems, but the evidence is suggestive. The important point is that, for all intents and purposes, the estimation of rents in the national accounts is not affected by underground transactions or tax evasion.

Similarly, any hidden rentals of cottages and garages would have virtually no effect on GDP because a market rent is recorded in GDP for all of them, whether they are occupied by the owner or rented out. Hidden rents are *de facto* captured (cottages and garages cannot be hidden like basement flats), unless the imputation made is too low to cover rents actually paid, and this is not the case. According to the Famex, \$359 million was spent on rental of vacation homes in Canada and abroad in 1992, while

rents imputed to cottages in GDP amount to \$2,163 million. Under the heading 'parking and garage rent', the Famex gives \$558 million, while the corresponding total entered in GDP is \$2,377 million, including taxes (paid garage rent, \$471 million, imputed garage rent, \$1,109 million, and parking, \$797 million) in 1992.

The same goes for rooms rented out in owner-occupied dwellings. The average market rent for a room is likely higher than the average rent imputed per room in owner-occupied dwellings. Any increase in spending on 'lodging' to account for hidden rentals would be partially offset (in the proportion of about 75%) by a drop in imputed rent on owner-occupied dwellings, leaving only the 25% mark-up of the landlord to be added to GDP. As an upper limit, we will assume that lodging paid is underestimated by 50%, which implies that only 25% of that amount is actually missing. Since about 60% of the amount recorded under this heading is for rent in non-profit homes for the aged, not subject to underground transactions, the adjustment will be applied to the remaining portion only, yielding \$35 million in 1992. Board paid is a similar case. Spending on food by all households has already been accounted for. What would be missing, again, is only the mark-up of the household providing board. Under the same assumptions as above, also applied to only 40% of the recorded amount for the same reason (board in non-profit homes for the aged), the maximum missing amount would be \$14 million.

Table 11. Potential Underestimation of Tips Due to Underground Transactions, 1992

	Total	Meals	Alcohol	Rooms
millions of dollars				
Potential understatement of receipts				
1. Hotels and motor hotels	224	56	22	146
2. Motels	171	43	17	111
3. Licensed restaurants	820	697	123	
4. Unlicensed restaurants	829	829		
5. Taverns, bars and night clubs	236		236	
6. Illegal wine, licensed establishments (\$52 + \$103)	155		155	
7. Contraband spirits, licensed establishments (\$154 + \$462)	616		616	
Sub-total, accommodation and food services	3,051	1,625	1,169	257
8. Barbers and beauty shops	373			
9. Taxicabs	30			
percentage				
Applicable percentage of tips				
10. Hotels and motor hotels		10	10	3
11. Motels		10	10	3
12. Licensed restaurants		10	10	
13. Unlicensed restaurants		8		
14. Taverns, bars and night clubs			10	
15. Illegal wine, licensed establishments			10	
16. Contraband spirits, licensed establishments			10	
17. Barbers and beauty shops	10			
18. Taxicabs	10			
millions of dollars				
Potential underestimation of tips				
19. Hotels and motor hotels	12	6	2	4
20. Motels	9	4	2	3
21. Licensed restaurants	82	70	12	
22. Unlicensed restaurants	66	66		
23. Taverns, bars and night clubs	24		24	
24. Illegal wine, licensed establishments	15		15	
25. Contraband spirits, licensed establishments	62		62	
Sub-total, accommodation and food services	270	146	117	7
26. Barbers and beauty shops	37			
27. Taxicabs	5			
28. Total, potentially missing tips	312			

3.5 Tips

Tips are calculated in the national accounts as a fixed percentage of gross business receipts, varying by industry and type of service provided (3% for accommodation, 10% for meals in restaurants, alcoholic beverages and hairdressing and 15% for taxi). The upper limit of tips missing from GDP due to underground transactions can be calculated directly by applying the same percentages to the estimated skimming of receipts by these establishments (shown in Table 4), as well as to the sales of illegally manufactured wine and contraband liquor in licensed establishments. The resulting total is \$312 million, or 15% of the tips of \$2.1 billion recorded in GDP for 1992.

3.6 Professional services

The possibility that professionals are also skimming some of their receipts cannot be overlooked. Spending on professional services could be underestimated as a result, since the estimation relies to some extent on taxation data. The category 'legal, accounting and other services' covers a wide range of expenditures, most of which are not subject to underground transactions (such as passport fees). It will simply be assumed that this spending category could be underestimated by 5%, or \$87 million, due to skimming of receipts. This would have to be an upper limit given the occupations involved. The phenomenon known as tax avoidance is probably more widespread here than tax evasion.

Personal spending for the services of physicians, dentists and other health practitioners is calculated residually in the national accounts, by deducting the share of the gross income of health practitioners coming from the provincial medicare plans and workers' compensation boards. The figures on gross income themselves are not those declared to Revenue Canada, but those estimated by Health Canada and are already adjusted for undercoverage. In the case of services covered by medicare, the type of fraud that may be occurring is the billing of services not provided rather than skimming, which does not lead to an understatement of GDP.¹ As well, the income from services paid for by insurance plans cannot be hidden. Skimming, if any, would be much smaller than for other businesses in services, possibly 5% as assumed for other professionals, to be applied to personal expenditure on 'medical care, dental care and the like', not to gross income. This would amount to \$121 million in 1992.

3.7 Food

Apart from the skimming of receipts in retail trade which, once distributed by commodity (see section 3.1 above and Appendix II), translates into \$1,512 million in food and non-alcoholic beverages, what could still be missing from GDP under the heading of food is a portion of the direct sales by farmers (fruits and vegetables, eggs, honey, maple products...). These sales are calculated from data on crop area, production and value for each fruit or vegetable, by province and by type of sale, as fresh produce or for processing.² In the case of fresh produce, the bulk of the production is bought by wholesalers, often after the area under cultivation is contracted out. Only a small proportion of fresh sales are made directly to consumers.

Farm cash receipts from fruits and vegetables amounted to \$1,525 million in 1992. On the basis of information supplied by provincial departments of agriculture (the British Columbia horticultural statistics are particularly complete), we estimated the share of direct sales (at roadside stands, farmers' markets...) at \$193 million. An underestimation of 20% on account of underreporting would yield \$39

million, to which may be added \$5 to \$6 million for eggs, honey and maple products, for a total of \$45 million, say \$50 million at the outside.

According to the 1992 Family Food Expenditure Survey released in December 1993, households spent on average \$8.74 a week on eggs, fresh vegetables and fresh fruits (excluding tropical fruits; imported vegetables cannot be excluded),³ or \$4,644 million in the aggregate. Of the total, 90% was spent in supermarkets and convenience stores, leaving 10% or \$464 million in farmers markets and fruit and vegetable stores. According to taxation data, fruit and vegetable stores (SIC 6015) had sales of \$446 million in 1992, of which 60% to 70% might have come from non-imported fruits and vegetables, leaving \$150 million to \$200 million for sales by farmers markets, a figure consistent with the one estimated above from the supply side, through farmers receipts. In light of this, the estimated \$50 million estimated for skimming by farmers appears reasonable.

Spending on food recorded in GDP is \$42.5 billion in 1992, against \$42.0 billion in the Famex, both including taxes, and \$40.4 billion, excluding taxes, in the Family Food Expenditure Survey. The amount of \$50 million, added to the \$1,512 million already estimated under the heading of skimming, would bring total spending on food to \$44.1 billion, \$2.1 billion, or 5%, higher than what is measured in the Famex, which in theory would include any skimming. Food is probably the single category best captured in the Famex, with a 100% response rate. A sample of 9,900 households, like that of the 1992 Famex, combined with a 100% response, is considered accurate within 1%, 19 out of 20 times. For this reason, a total understatement of \$1.5 billion must be considered an upper limit.

3.8 Childcare

Like home renovations, childcare is another area where underground activity is said to take place. However, national accounts estimates of spending on childcare are already adjusted considerably for undercoverage, by over \$1 billion in 1992.⁴ One way to assess the validity of these estimates is to compare

3. *Family Food Expenditure Survey*, Catalogue No. 62-554.

4. It would be excessive to consider all income from babysitting in the home as undeclared or unreported. Most of it is not declared simply because it is below the taxable threshold. It is not reported either because Statistics Canada does not conduct a survey of babysitters (and neither does another government department or agency). This is why the national accounts adjustment is for undercoverage, not underground transactions.

1. In such a case, on the contrary, GDP would be overstated. The billing of services not provided should be deducted from government current expenditure and from the net income of health professionals as it would not constitute an expense or an income related to current production, but a transfer.

2. See *Fruit and Vegetable Production*, Catalogue No. 22-003, for detailed statistics and a description of sources and methods.

Table 12. Spending on Child Care: National Accounts versus Famex, 1992

	Family Expenditure Survey			National Accounts
	Spending \$millions	Households reporting %	thousands	Spending \$millions
1. Day-care centres and day nurseries	1,165	5.2	530	n/a
2. Week-day care in the home	553	2.4	245	n/a
3. Sub-total, week-day child care	1,718			
4. Other child care outside the home	638	4.1	420	n/a
5. Other child care in the home	280	8.7	890	n/a
6. Sub-total, other child care	918			
7. Total, child care	2,636	14.5	1,480	4,262
8. Less: subsidies	-			500 ²
9. Less: amount to be transferred to domestic services	-			750 ²
10. Comparable total, child care (7 - 8 - 9)	2,636			3,012

n/a Not available

Note 1. The percentages of households reporting are not additive because some households report spending in more than one category.

Note 2: National accounts estimate.

Source: *Family Expenditure in Canada, 1992*, Catalogue No. 62-555 and National Accounts.

them with the amounts captured in the Famex under this heading. Two adjustments are necessary to make the comparison valid. First, one must deduct from the national accounts estimates the government subsidies toward daycare, since the figures recorded in the Famex pertain only to what is spent directly by households. Second, a misclassified amount of \$750 million must be transferred to the category 'domestic services'.

The Famex figures, shown in Table 12 above, are quite plausible at face value: \$1,718 million for spending on week-day childcare (\$1,165 million in day-care centres and \$553 million in the home) plus \$918 million in other childcare expenses, for a total of \$2,636 million, yielding an average of \$1,780 for the 14.5% of households (about 1.5 million) who reported any spending. The amount of \$1,718 million for week-day childcare in 1992, both in terms of the number of households reporting (a maximum of 775,000, since households may spend both under lines 1 and 2) and average spending (\$2,220), is quite consistent with the amount of \$1,585 million claimed as income tax deduction for child care expenses by 666,000 households (for an average of \$2,380) in 1991.¹

It is reasonable to assume that the other 800,000 households or so who reported to the Famex having spent anything, often only for occasional childcare, did not spend as much on average as those who needed week-day child care and had receipts for tax purposes. This explains why the average spending

spread over 1.5 million households is lower than for those who claimed the tax deduction. The total recorded in the Famex still exceeds the one claimed in deduction by about \$1 billion, not a negligible amount considering that many parents either know or have reason to believe that a good part of it may go undeclared.

The taxation statistics also reveal that a total of 4.8 million households claimed personal exemptions for children under 18 in 1991. Of those, over 1.1 million were lone parent families with a median income of \$21,000, who would find it difficult to spend \$1,780 annually on childcare. Among the 3.7 million husband-wife families with children, over 1.1 million had a total income before tax below \$40,000, leaving 2.6 million relatively well-off families with children under 18.² Only a portion of these families would have young children who might require childcare. The 1.5 million households who reported to the Famex having spent an average of \$1,780 on child care would represent 31% of all families with children under 18, and close to 60% of those with children under 18 and an income over \$40,000. The proportion of families reporting and the average spending of \$1,780 per family are thus substantial.

The national accounts estimates, by comparison, are roughly 15% higher than those from the Famex. This translates into either 15% more families (225,000) spending \$1,780 each annually, or the same number,

1. Revenue Canada, *Taxation Statistics*, Table 3. These are the last available figures.

2. Small Area and Administrative Data Division, Neighbourhood Income and Demographics, Table 5, 'Number of Families by Total Income and by Number of Children', December 1993.

1.5 million, spending on average \$2,047. There are no doubt underground transactions relating to child care, but it would appear at face value that the undercoverage adjustment already incorporated in GDP is sufficient to account for them. The \$137 million estimated as skimming of receipts by day-care centres and day nurseries (Table 4) would raise to 19% the gap between the national accounts estimates and the figures recorded in the Famex, and should be considered the upper limit of what may still escape measurement due to underground transactions relating to child care.

3.9 Domestic and household services

Underground transactions (in the form of skimming by legitimate businesses and non-reporting by very small businesses operating entirely underground) could affect other categories of expenditure not covered so far, either separately or through the general estimate of skimming in retail trade and services. For many of these, nevertheless, national accounts estimates are either close to (case 1) or higher (case 2) than amounts recorded in the 1992 Famex, or else, based directly on that survey (case 3), generally believed to yield unbiased results like other household surveys. Relevant examples here are (1) video rentals,¹ (2) parking, and (3) private courses (an estimate buried in the larger aggregate 'other educational and cultural services'). Underestimation should only be assumed when there is reason to suspect that amounts recorded could really be too low, even when comparable to those in the Famex. This is the case for domestic and household services.

Three series make up this broad category, namely 'pet care', 'domestic services' and 'miscellaneous household services', with a total spending recorded in GDP of \$1,809 million in 1992, to which must be added the \$750 million to be transferred from child care, for a total of \$2,559 million. The roughly corresponding amount in the Famex (under 'tenants' maintenance and repairs', 'domestic and other

custodial services', 'veterinary and other services' and 'horticultural services and snow removal') is \$2,090 million.

Nine per cent, say one in ten households, reported some spending on domestic services in the Famex. If each of those spent \$30 a week for cleaning services during 50 weeks, this alone would add up to \$1,533 million, against the \$815 million shown in the survey under this heading. Adding the gap between the two to the \$2,090 million already recorded in the Famex yields \$2,808 million, about \$250 million more than what is recorded in GDP (\$2,559 million). This \$250 million, combined with the \$203 million already added as 'skimming' under the category 'domestic and household services' (Appendix II), would bring the total spending recorded in GDP under this heading to \$3,012 million (\$2,559 + \$453). This is 44% higher than the comparable amount appearing in the Famex and it should be considered an upper limit.

1. Video rental businesses are so new that they were not assigned a code in the most recent Standard Industrial Classification, released in the early eighties. It is not known how the ones that did declare would have been coded by Revenue Canada. They are not yet surveyed by Statistics Canada. For all intents and purposes, the present estimate recorded in personal expenditure is an imputation, subject to measurement error, but not on account of underground transactions: no transactions are yet captured. Thus no skimming can, or need be estimated here.

3.10 Summary

Detailed estimates of personal expenditure, with and without taxes (GST and provincial sales taxes), along with corresponding figures for potential underestimation due to underground transactions, are shown in Appendix II. In total, underground transactions relating to personal expenditure on goods and services could amount to \$14,830 million in 1992, or 3.8% of spending without taxes, and 3.5% of spending including taxes. This total is distributed as shown in Table 13.

As explained earlier, for many categories of spending, underground transactions are either absent or have little or no effect on national accounts estimates themselves. Such is the case for imputed rent (which covers mortgage payments, property taxes..), motor vehicles, fuels, utilities, telecommunications, cable television, purchased transportation, lotteries, health services, insurance, financial services and interest on the consumer debt. Operating expenses of non-profit institutions, included in personal expenditure, are not affected either. Overall, these 'exempt' categories account for 46% of total personal expenditure.

In addition, the net effect on rents totalling \$21 billion is only \$220 million, or 1%, when are counted as covert rentals twice as many rented dwellings as the Census believes were really missed during the enumeration. If paid rents are added to the 'exempt' categories, the proportion of the estimate of personal expenditure (excluding GST and provincial sales taxes) not affected by underground transactions goes up to 51%. It implies that other expenditures subject to it (49%), could be underestimated by over 7%.

This percentage is extremely high, and essentially reflects the unrealistic assumptions made for skimming (15% and 25% respectively of gross receipts of small businesses in retail trade and services, shown in Table 4). A more plausible assumption for skimming, also shown in the table, would be in the order of 10% of gross business receipts in retail trade (15% for repair shops, belonging to retail trade) and 20% in services. It would imply potentially hidden receipts of \$7,824 million (instead of \$10,836 million), and would further reduce the estimate of tips by \$47 million, bringing down the estimated underground transactions potentially missing in personal expenditure to \$11,771 million, or 2.8% of the total.

Table 13. Upper Limit of Underground Transactions Potentially Missing from Personal Expenditure, 1992

	Underground transactions	Published estimates	Proportion
	millions of dollars		%
1. Skimming of receipts by businesses selling to households	10,836		
2. Contraband tobacco	1,057		
3. Contraband spirits	768		
4. Illegally manufactured wine	515		
5. Licensee mark-ups on illegal alcohol	565		
6. Rent, room and board	269		
7. Tips	312		
8. Professional services	208		
9. Food	50		
10. Domestic and household services	250		
11. Sub-total	14,830	393,053	3.8
12. GST and provincial sales taxes	0	26,483	
13. Total	14,830	419,536	3.5

Table 14. Upper Limit of Underground Transactions Potentially Missing from Expenditure-based GDP, 1992

	Underground transactions	Published estimates	Proportion
	millions of dollars		%
1. Personal expenditure on goods and services	14,830	419,536	3.5
2. Government current expenditure on goods and services	0	148,377	
3. Government investment	0	16,508	
4. Business investment in fixed capital	3,578	113,440	3.2
5. Residential construction	3,578	43,992	8.1
6. New residential construction	1,883	20,934	9.0
7. Alterations and improvements	1,695	12,153	13.9
8. Transfer costs	0	10,905	
9. Non residential construction	0	30,189	
10. Machinery and equipment	0	39,259	
11. Business investment in inventories	-15	-2,558	-0.6
12. Exports	1,100	181,948	0.6
13. Merchandise	800	156,567	0.5
14. Non-merchandise	300	25,381	1.2
15. Less: Imports	1,003	185,751	0.5
16. Merchandise	1,003	147,588	0.7
17. Non-merchandise	0	38,163	
18. Gross Domestic Product at market prices	18,490	688,541	2.7
19. Final domestic demand (1 + 2 + 3 + 4)	18,408	697,901	2.6

4. Overall results

4.1 Interpretation of results and review of assumptions

Under the various assumptions outlined above, the maximum underestimation of GDP on account of underground transactions not recorded on the expenditure side would be \$18.5 billion, or 2.7% of GDP, derived as shown in Table 14. On the income side of GDP, this amount would all be recorded either as wages and salaries, corporate profits or net income of unincorporated business, with the largest part probably as net income, given the type of activities commonly associated with underground production (smuggling, home renovations, household services).

This total of \$18.5 billion *should not be interpreted as:*

- the total value of underground economic transactions;
- the value of underground economic transactions missing from the official GDP;
- a comprehensive measure of tax evasion.

It is only an estimate, not a measure, of the maximum value of the portion of underground production which may still be missing from the official GDP. Not all underground transactions constitute economic production, and therefore not all belong in GDP. Of

the transactions that do belong, some are measured (even if undeclared or unreported), while others are missing. The 2.7% represents the upper limit of what could possibly be missing, not what is actually missing (which would be much less). *If Statistics Canada were convinced that this amount was really missing, it would add it to GDP, as it will do in June 1994 in the case of the estimates for contraband tobacco shown in Table 7, and as was done in the past whenever an underestimation of GDP was uncovered.*

The assumptions underlying the estimates take into account which areas of the economy are most likely to be subject to underground activity, and which ones are least well measured in the national accounts. But they remain speculative. In the hypothetical amount of \$18.5 billion, only the net effect of spending on contraband tobacco, \$423 million (personal spending of \$1,057 million, less inventory change of \$15 million, less imports of \$619 million), or 2.3% of the total, is a 'solid' number. The estimate of the remainder, a full \$18 billion, is based on plausible, but extreme assumptions. This \$18 billion in underground transactions has not been observed or captured as was the rest of economic activity. It is not the value of underground transactions that escape measurement in the official GDP and should not be taken as such.

In the case of alcohol, consumption of legal products has dropped significantly, about 23% for spirits in the last seven years (against 45% for tobacco), which

does tend to confirm the presence of underground transactions. The increase in seizures of alcohol (well documented by the LCBO in Ontario) is additional proof that contraband is escalating, even though the volume figures put forward by the LCBO and the Association of Canadian Distillers seem too high. The other assumptions made regarding prices, smuggler and licensee mark-ups and market penetration outside Ontario are all, if not an upper limit, certainly in the upper range. Under this worst case scenario, all underground transactions relating to tobacco and alcohol combined would still only increase GDP by \$1,887 million (personal expenditure, \$2,905 million, less inventory change, \$15 million, less imports, \$1,003 million), or by less than 0.3% in 1992.

The other estimates are even more speculative; some reflect almost unrealistic assumptions. The estimates pertaining to exports are not supported by evidence. There are few exported goods and services for which underground transactions are even suspected. One would be hard pressed to cite a single commodity smuggled out of Canada with a value approaching that of the illegal imports of tobacco in Canada (\$0.6 billion in 1992, \$1.1 billion in 1993). About 90% of our merchandise exports involve staple commodities and manufactured products often traded at international prices. Moreover, our exports to the United States, accounting roughly for 70% of the total, are valued on the basis of US Customs import documents in which they are not likely undervalued.

In the case of residential construction, measured investment has to be considered reliable in spite of underground activity because the estimation is essentially made from the demand side, not the supply side: it is independent from the receipts declared or reported by businesses or self-employed workers in the industry. Considerable adjustments are already built into the estimates of the average value of new residential construction, and the number of housing starts is a reliable statistic. Estimates for home renovations largely rely on a survey of 25,000 homeowners, the results of which are broadly in line with those of other surveys. The implicit ratios of the sales of building materials, well captured by the statistical system, to the measured output of residential construction confirm that this measured output is reasonably accurate. The *average* adjustments of 5%, 10% or 20% which have been applied on top of those already built-in would bring down the ratio of material inputs to output by a full five percentage points. If all the estimated underground transactions that may escape measurement corresponded to value added, unmeasured value

added would represent 40% of the recorded value added for the industry. Higher assumptions than those already made would imply an unrealistic production function in residential construction, unless it could be proven that the recorded production and consumption of building materials are much too low.

With respect to personal expenditure, other than tobacco and alcohol, the estimate for skimming of receipts by small businesses amounts to \$10.8 billion, or 73% of the total. This estimate is based on the assumption that *all* small businesses selling to households, defined as all unincorporated businesses plus all the incorporated ones with annual sales below \$1 million, are skimming *on average* 15% of their gross receipts for those in retail trade, and 25% for those in services. *This would imply that all small businesses hide at the minimum 50%, perhaps as much as 70%, of their 'true' net business income.* The true margin on gross receipts would be 19% in retail trade (instead of the declared margin of 6-7%), and 37% in services (instead of the declared margin of 20-21%). It would be extremely unlikely, if not impossible, for all small businesses to succeed in hiding that much income.

Given all those extreme assumptions, it follows that the underground production really escaping measurement would be much less than the 2.7% of the official GDP, or \$18.5 billion estimated as an upper limit for 1992. And this is why Statistics Canada will not be raising the 1992 GDP by that amount.

4.2 Comparison with Statistics Canada's previous study on the underground economy

How does the upper limit of 2.7% for 1992 compare with Statistics Canada's earlier estimate of the size of the underground economy for 1981? In his study, Berger had arrived at an upper limit of 2.9% on the income side of GNP, and of 3.5% on the expenditure side.¹ However, the study was done before the last historical revision of the national accounts, when estimates of spending on alterations and

1. The results of this study were often wrongly interpreted to mean that underground production represented between 2.9% and 3.5% of GNP in 1981. Yet, just as in this study, the results were based on extreme assumptions, of the type 'all those employed full-time in occupation x are working part-time off the books and all those formerly employed as x but now unemployed are working full-time off the books for small businesses or households during 50 weeks a year'. They were very much an upper limit.

Table 15. Statistics Canada's Previous Estimate of the Upper Limit of the Underground Economy (1981)

	Assumed understatement	
	25%	50%
	millions of dollars	
1. Skimming of receipts by small businesses		
Food	771	1,542
Clothing	790	1,580
Flowers	84	167
Daycare	33	65
Domestics	159	318
Motor vehicle repairs	329	658
Recreation	387	773
Jewelry	295	590
Hairstyling, including tips	224	448
Meals in restaurants, including tips	731	1,461
Other	391	781
Total, skimming of business receipts	4,194	8,383
2. Alterations and improvements, residential	3,000	3,000
3. Alterations and improvements, non-residential	264	529
4. Total understatement (1 + 2 + 3)	7,458	11,912
5. 1981 GNP, prior to 1986 historical revision	339,797	339,797
6. Understatement as a percentage of 1981 GNP (4 / 5)	2.2	3.5
7. 1981 GDP, prior to 1986 historical revision	351,468	351,468
8. Understatement as a percentage of 1981 GDP (15 / 18)	2.1	3.4
9. Understatement, historical revision taken into account (4 - 2)	4,458	8,912
10. 1981 GNP, historical revision taken into account (2 + 5)	342,797	342,797
11. Understatement as % of 1981 GNP, historical revision taken into account (9 / 10)	1.3	2.6
12. 1981 GDP, historical revision taken into account (2 + 7)	354,468	354,468
13. Understatement as % of 1981 GDP, historical revision taken into account (9 / 12)	1.3	2.5

Source: Berger, *op. cit.*, and *National Income and Expenditure Accounts*, Catalogue No. 13-201, issue 1967-1984.

improvements were completely revamped. The Berger results included an amount of \$3 billion as "the maximum estimate of the potential unrecorded economy in capital improvements", based on a comparison of preliminary Famex data for 1982 and national accounts estimates *at that time*. Not only was that amount eventually incorporated in GDP, but the actual revision was actually larger than what was then anticipated. *It is no longer missing from GDP.*

Spending on alterations and improvements was revised up by \$6.0 billion due to undercoverage for 1984 (from \$2.9 billion to \$8.9 billion). Part of that amount came from spending being shifted from current to capital expenditure, and personal expenditure was simultaneously revised down as a result by \$1.1 billion. Another portion of the revision reflected the inclusion of government capital transfers to unincorporated business, in the form of grants for housing construction, energy substitution and home

insulation. These payments by the federal government totalled \$463 million that year, to which should be added provincial government assistance of at most \$176 million, for a total of \$639 million.¹ The net effect of these revisions on GDP was ultimately of \$4.3 billion for 1984, against the preliminary estimate of \$3 billion used by Berger for 1981.

The amount of \$3 billion must therefore be deducted from the Berger estimate of unrecorded transactions, and added instead to the estimate of GNP at the time. This brings down the hypothetical understatement of GNP from 3.5% to 2.6%. To be comparable to the one calculated for 1992, this upper limit must also be expressed as a percentage of GDP instead of GNP,

1. Total capital assistance from provincial governments to unincorporated business was \$176 million in 1984, with most of it going to new housing and renovations. See *National Accounts and Expenditure Accounts*, Catalogue No. 13-201, Table 50, 'Capital Assistance'.

which brings it down further to 2.5%.¹ Finally, this limit was based on the assumption that small businesses selling to households skimmed 50% of their gross receipts. This percentage is simply unrealistic, even as an upper bound. If a 25% understatement is adopted instead, closer to the percentage assumed for 1992 (19.6% implicitly overall for retail trade and services as shown in Table 4) and which Berger had also calculated, the upper limit drops to 1.3% on the expenditure side of GDP, as can be seen from Table 15. The upper limit calculated on the income side would also drop, at least by all the wages, profits and net income associated with the \$3 billion (and more) in alterations and improvements which are now recorded in GDP.

The hypothetical GDP underestimation of 2.7% for 1992 is thus not lower than the one obtained for 1981, once the two results are put on a comparable basis. For all that, this should not be construed as indicating that underground production has doubled in proportion of GDP in eleven years. The 1981 and the 1992 estimates are based on somewhat different approaches and embody different assumptions. Both are speculative in nature, and calculating an increase between the two points in time would be an operation devoid of any meaning.

With these *caveats*, an upper limit of 2.7% does suggest that underground production has grown as a proportion of GDP, if only by the value added of tobacco and alcohol smuggling. From the expenditure side of GDP alone, it is impossible to tell whether the marginal skimming of business receipts has increased on average or whether undervaluation of building permits is larger or more prevalent now than ten years ago. That would be best identified on the income side of GDP, by measuring the gap between the incomes recorded in GDP and those declared to Revenue Canada, as is done in Part III. There is some evidence to that effect, discussed below, even though the GDP estimates are still preliminary for 1991 and 1992 and most taxation statistics are not yet available for 1992.

1. Statistics Canada adopted GDP as the central aggregate of its national accounts in July 1986. At the same time, the 1981 GNP at market prices was revised from \$339.8 billion to \$344.7 billion, and the 1981 GDP at market prices, from \$351.5 billion to \$356.0 billion.

III. The underground economy in its totality

The results obtained in Part II pertain to the underground production which may escape detection in the official GDP estimate, in other words, to the unmeasured underground economy. They are important in their own right, in that they demonstrate that Canada's statistical system is not leading the country astray by failing to capture underground transactions of very large magnitude.

But two other important and difficult questions remain to be answered: (1) what is the size of the underground economy in total, defined as the market production which escapes detection by the tax authorities (consisting of underground production both measured and unmeasured in GDP); (2) is this underground economy (measured and unmeasured) growing in relation to the measured economy?

The methods employed in the national accounts are designed to measure economic production in its totality, not to identify separately reported and unreported transactions. However, an analysis of national accounts estimates and other official statistics can shed some light on underground economic activity in Canada, and in particular, may indicate whether or not it has been on the increase in recent years.

1. Measured underground production: national accounts estimates versus taxation data

Although underground transactions and tax evasion are not exactly the same thing, the two are closely linked. If, as we contend, unmeasured transactions are smaller in the aggregate than undeclared or unreported ones and underground production is not all missing from GDP, then incomes estimated by the System of National Accounts should be higher than those declared to Revenue Canada, and the difference between the two should give us an approximation, albeit a very imperfect one, of the underground production that is captured in GDP.¹

1. This idea has been explored before with a view to estimating tax evasion. See Éthier.

The income from underground activities can only be recorded in GDP as wages and salaries, corporation profits or net income of unincorporated business. The estimation of the other income components of GDP - depreciation, indirect taxes collected - is not affected by the existence of underground transactions.²

1.1 Wages and salaries

A comparison of wages and salaries as recorded in GDP and employment income declared to Revenue Canada (Table 16) reveals little because the estimation of the former relies essentially on the latter.³ Estimates of wages paid by households for domestic services and childcare and of amounts that employers are not required to declare, such as employees' tips and wages below \$500, are then added to the Revenue Canada total. These adjustments are not made explicitly to account for underground production (which may or may not be occurring), but they nonetheless do reduce any missing amount in this respect.

In relation to the total however, these adjustments are small and the wages and salaries recorded in GDP are still very close to the total employment income reported by employers to Revenue Canada. The gap between the two sets of figures is due in part to underground production (mainly tips and income from childcare here) but largely reflects conceptual differences. On account of these conceptual differences, that gap can only in fact be approximated. As measured in Table 16,⁴ it has grown from \$3.5 billion in 1983 to \$5.0 billion in 1991 (the most recent year for which the comparison can be made), but in percentage terms, it has remained

2. See Appendix I for an explanation.

3. More precisely, the national accounts estimate is based on the T-4 Supplementary file containing all T-4 statements issued by employers. The T-4 file should not be confused with the T-1 file containing individual tax returns, which are compiled in Revenue Canada's *Taxation Statistics*. The total of employment earnings derived from the latter is lower. Using the employer file ensures that all reported earnings are counted in GDP even though some employees neglect to file a tax return.

4. The gap shown is a little overstated: the national accounts estimates include tips, whereas Revenue Canada's do not. Tips are declared by the employee on his tax return (the T-1 form), not by the employer on the T-4 statement. They are not tabulated separately by Revenue Canada, but lumped with other types of income under the heading 'other employment income' in *Taxation Statistics*. Adding the latter as a proxy for tips to the 'employment income' reported by employers would have understated the gap instead. For 1990, \$2.2 billion were recorded in wages and salaries on account of tips, while \$1.9 billion was declared as 'other employment income'.

Table 16. Wages and Salaries: National Accounts versus Revenue Canada

	1983	1984	1985	1986	1987	1988	1989	1990	1991
	billions of dollars								
National Accounts:									
1. Civilian wages and salaries ¹	198.3	213.4	229.9	245.4	266.7	292.6	316.3	330.8	335.9
2. Military pay and allowances	2.1	2.3	2.4	2.6	2.7	3.0	3.2	3.5	3.5
3. Total wages and salaries	200.4	215.7	232.3	248.0	269.4	295.6	319.5	334.3	339.4
Revenue Canada:									
4. Employment income ²	199.2	214.4	230.9	246.0	267.9	294.2	318.1	331.9	337.0
5. Later amendments				0.4		-0.4			
6. Allowable expenses ³	1.0	1.1	1.2	1.4	1.7	1.7	2.0	2.0	2.0
7. Taxable allowances and benefits ⁴	2.6	2.7	2.9	3.1	3.2	3.6	4.2	3.5	3.5
8. Employer medicare contributions ⁵	1.3	1.3	1.4	1.4	1.5	1.6	1.7	0.5	0.6
9. Adjusted employment income (4 + 5 - 6 - 8)	196.9	212.0	228.3	243.6	264.7	290.5	314.4	329.4	334.4
10. Gap (3 - 9)	3.5	3.7	4.0	4.4	4.7	5.1	5.1	4.9	5.0
11. Gap as % of national accounts total	1.7	1.8	1.7	1.8	1.7	1.7	1.6	1.5	1.5

Note 1: includes tips.

Note 2: includes military pay and allowances, excludes tips; from T-4 Supplementary file, Box 14.

Note 3: part of employment income but not treated as wages and salaries in GDP.

Note 4: part of employment income but only partly treated as wages and salaries in GDP.

Note 5: portion of taxable allowances and benefits not treated as wages and salaries in GDP; national accounts estimate.

virtually constant. Growth in underground economic activity, if any, does not show up in the national accounts estimate of labour income. Any wages paid to workers hired off the books would be missing from GDP because it is highly unlikely that employers would issue a T-4 statement in such instances.

In his study on the unrecorded economy, pertaining to 1981, Berger estimated that these wages could have represented as much as 1.1% of GNP. This result was based on a twofold assumption: that hiring off the books was limited to certain occupations and to establishments with fewer than 20 employees in certain industries, and that all workers falling in those categories were actually employed off the books at a wage rate equivalent to 70% of the prevailing rate. This estimate was an upper limit: not all employers in the selected firms and industries employ all the employees in the selected occupations off the books. Paying wages under the table requires falsification of books and involves employers and employees in a conspiracy which can easily break down.

1.2 Corporation profits

As in the case of employment income, the comparison of national accounts estimates of profits with declared profits does not reveal much or anything about underground economic activity, although for different reasons. In short, conceptual differences preclude a comparison of 'national accounts' profits

and 'taxation' profits, themselves different from 'book' profits, especially for the financial sector. Moreover, many omissions in other income components of GDP translate into a corresponding overstatement of profits, because the business operating surplus in the input-output accounts, equal to the sum of profits and other types of business income in the income and expenditure accounts, is calculated residually.¹ As a result, even when conceptual differences are accounted for, it is difficult to interpret any discrepancy between national accounts estimates of corporate profits and those declared for tax purposes. An increasing or decreasing gap between the two is not likely to be indicative of a growing or shrinking underground economy.

In any event, public corporations in Canada are not likely to be very much engaged in underground production. They are often large scale, complex and bureaucratic organizations in which skimming and hiring off the books are not easily arranged. They are under the scrutiny of Revenue Canada, their bankers, the stock exchange and other monitoring bodies. For a firm, hiding income might serve to lower taxes in the

1. A case in point is that of severance pay and other retirement allowances, which are a form of deferred labour income. Until now, such payments have been mostly left out of labour income in GDP because they are not measured effectively by the statistical system. The profits and the income side statistical discrepancy are correspondingly overstated. A measurement problem of this kind usually affects the composition of GDP rather than its level.

short run, but posting less favourable financial results than might otherwise be the case is not without consequence either. Corporations may minimize their profits for tax purposes, but normally do so by using the tax laws to their best advantage: the situation here is one of tax avoidance rather than tax evasion. Finally, the activities commonly associated with underground production (smuggling, home renovation, small scale residential construction, covert rentals, provision of household services, sale of homegrown produce, etc.) are not ones in which large corporations are usually engaged.

It would be unrealistic to claim that no profits are ever hidden. Concealment of profits is probably more easily achieved, and thus more widespread, in small corporations. In 1992, on a total of 869,000 corporations, 765,000 had revenues below \$1 million, and 261,000 of those had revenues below \$25,000 or no revenue. Their share of the gross business income of all corporations (as declared to Revenue Canada) was 10.8%.¹ If one assumes that the share of declared gross business income is a reasonable approximation of the share of profits measured in GDP, profits of these small corporations could have ranged between \$3 to \$4 billion on total profits of \$31.9 billion in 1992. An underestimation of 100% here would still amount only to another \$3 to \$4 billion, about 0.5% of GDP. Even if small corporations were increasingly hiding their profits, the missing amounts would still be negligible in proportion to GDP.

1.3 Net income of unincorporated business

Underground production is thought to be concentrated in certain occupations and industries where unincorporated businesses and self-employment are important. For this reason, a comparison of national accounts estimates of net income of unincorporated business with the corresponding taxation data is particularly appropriate. Net income is the component subject to most of the adjustments to GDP on account of unreported transactions. National accounts estimation methods do make use to some extent of taxation data and there are some conceptual differences between the two sets of figures (with respect to the definition of both income and allowable expenses), as in the case of corporate profits, but

they do not invalidate the comparison. The only major adjustment required is to remove from the national accounts estimate the net rental income on owner-occupied dwellings, an imputed amount which does not constitute income for tax purposes.

The national accounts estimate is always higher than what is declared to Revenue Canada as seen in Table 17 below. However, a sizeable portion of the gap comes from farm income, virtually all of which reflects conceptual differences rather than undeclared income on the part of farm operators.² Once farm income is removed from both sets of figures, the remaining difference could essentially be attributed to tax evasion. This gap has increased gradually every year except in 1988, but never by more than \$500 million until 1991, when it jumped by \$1.2 billion, from \$4.5 to \$5.7 billion.

A large and increasing portion of that remaining gap comes from rental income, where the national accounts estimate now exceeds the amount declared to Revenue Canada by \$1,680 million, against \$228 million in 1983. The gap resulting from activities other than farming and rental of dwellings represents essentially a level adjustment with a cyclical pattern, until its marked increase in 1991. Except in this last year therefore, the National Accounts are not capturing any growth in underground production other than in rental income. This pattern suggests that underground transactions have indeed escalated in 1991.

Statistics Canada makes its own tabulation of selected taxation statistics, some of which are now available for 1992.³ According to this source, net self-employment income (the sum of incomes from business, professions, commissions, farming and

2. Agriculture is an activity characterized by subsidies, fixed prices, production quotas and marketing boards. To be considered a farm operator by Revenue Canada and be entitled to tax benefits, the farm owner must declare income from farming. Similarly, the farmer must also declare income from production, area under cultivation, etc. to be eligible for various income supplement programs, or may even be paid not to produce. All in all, not only would it be difficult for farmers to engage in hidden transactions, it is often not profitable for them to do so. Some farmers may hide part of the receipts from the direct sale of fresh produce to consumers, but amounts involved would be so small that they can be ignored here. See Part II, section 3.7 for an estimate.

3. Small Area and Administrative Data Division has compiled these statistics back to 1980. The figures shown by Revenue Canada in *Taxation Statistics* are based on a sample of tax filers, tabulated after approximately an 18 month lag. Those from Statistics Canada are a tabulation of amounts declared by all tax filers, after a one-year lag.

1. Source: Statistics Canada, Business Register Division, taxation data files.

Table 17. Net Income of Unincorporated Business: National Accounts versus Revenue Canada

	1983	1984	1985	1986	1987	1988	1989	1990	1991
	millions of dollars								
Net Income, National Accounts:									
1. Non-farm uninc. business, incl. rent	21,061	23,927	26,447	28,856	30,977	32,868	34,461	35,006	36,324
2. Of which, imputed rental income	7,183	8,386	9,421	10,205	10,472	10,611	10,710	10,703	11,018
3. Of which, rental income received	810	1,171	1,215	1,410	1,348	1,411	1,375	1,422	1,384
4. Farm income	2,568	3,380	2,808	3,946	2,890	4,275	3,042	3,535	3,195
5. Total (1 - 2 + 4)	16,446	18,921	19,834	22,597	23,395	26,532	26,793	27,838	28,501
Net Income, Revenue Canada:									
6. Business income	3,739	4,019	4,538	4,958	5,542	6,478	6,647	6,506	5,772
7. Professional income	6,149	7,129	7,656	8,066	8,863	9,974	11,307	12,096	12,489
8. Commission income	523	603	649	724	839	850	980	1,104	1,222
9. Farm income	1,747	2,024	1,761	1,698	2,109	2,131	2,020	1,471	1,377
10. Fishing income	331	319	399	522	635	541	446	424	416
11. Rental income	582	711	860	975	999	838	377	-355	-296
12. Total (6 + 7 + 8 + 9 + 10 + 11)	13,071	14,805	15,863	16,943	18,987	20,812	21,777	21,246	20,980
Gap, National Accounts estimates less Revenue Canada figures:									
13. Total (5 - 12)	3,375	4,116	3,971	5,654	4,408	5,720	5,016	6,592	7,521
14. Of which, farm income (4 - 9)	821	1,356	1,047	2,248	781	2,144	1,022	2,064	1,818
15. Of which, other than farm (13 - 14)	2,554	2,760	2,924	3,406	3,627	3,576	3,994	4,528	5,703
16. Of which, rental income (3 - 11)	228	460	355	435	349	573	998	1,777	1,680
17. Of which, other activities (15 - 16)	2,326	2,300	2,569	2,971	3,278	3,003	2,996	2,751	4,023

Source: *National Income and Expenditure Accounts*, Catalogue No. 13-001, and Revenue Canada, *Taxation Statistics*, Table 9.

fishing) was \$20.2 billion in 1991 and \$21.4 billion in 1992. The corresponding SNA estimates (line 5 minus line 3 in Table 17) are \$27.1 billion and \$28.0 billion, resulting in a gap for net income of self-employment of \$6.9 billion in 1991 and \$6.6 billion in 1992. The national accounts estimates are still preliminary for 1991 and 1992 and it is difficult to draw any conclusion from this comparison. As measured income is much lower than measured expenditure in GDP for 1991 and 1992 (see section 2.1 below), incomes are more likely to be revised upward than downward, and so is the gap between national accounts estimates and taxation data.

1.4 Total underground production, measured and unmeasured

To summarize, the gap between national accounts estimates and taxation data reflects not only conceptual differences but also underground transactions captured in GDP but escaping detection by the tax authorities. In 1991, it stood at \$5 billion for wages and salaries and \$7.5 billion for net income of unincorporated business, for a total of \$12.5 billion. *The gap that can actually be attributed to underground production already measured in GDP is narrower because the portion coming from agriculture must be discounted, and could thus amount to \$10.7 billion or 1.5% of GDP in 1991 as an upper limit.* In all

likelihood, it amounts to even less. Income below the taxable threshold does not have to be declared to Revenue Canada, whereas GDP purports to measure all income from production, regardless of any threshold. *An unknown portion of the gap in factor incomes between Revenue Canada and the national accounts comes from legitimate earnings which do not have to be declared because they fall below the taxable threshold, and not from underground transactions.*

This upper limit of 1.5% does not take into consideration the other factor incomes, namely interest and profits. However, it is unlikely that the national accounts are capturing significant underground transactions under these headings, due to several reasons.

First and foremost, as pointed out, there is very strong presumption that most corporations, certainly the large ones, are not involved in underground activity. By law, they are all registered, and probably not a single one escapes measurement, however imperfect. Small corporations may engage in skimming, but even at that, they are subject to more controls and regulations than unincorporated businesses. The national accounts could not capture much hidden income related to underground transactions because a) not much income is hidden by corporations in the first place, and b) whatever is hidden is too small in proportion to what is declared to

cause imbalances which the national accounts could detect and correct.

In addition, most of the explicit adjustments to account for undercoverage in the national accounts pertain to wages and salaries and to net income of unincorporated business, even if at least part of them more properly should have been made to profits. A case in point is that of residential construction, for which the measured output is reliable, in spite of underground transactions in the industry. The residually calculated surplus (measured output, less intermediate purchases, less wages) of that industry in the input-output tables is larger than the directly calculated surplus (in the form of profits plus net income). The imbalance is resolved solely by raising the net income of unincorporated construction firms.¹ Yet it is likely that part of the underground transactions captured can be attributed as well to small incorporated construction firms and, logically, part of the upward adjustment to net income should have been made to profits instead.

Finally, some undeclared interest income will show up in GDP under net income of unincorporated business. The example here is that of mortgage interest received by individuals, for which the estimate recorded in GDP is likely too low (see Appendix I). As mortgage interest is deducted from gross rents to arrive at net rental income, the underestimation in this instance translates into an overestimation of net rental income which enters net income of unincorporated business.

Measured underground production thus represents, at the most, 1.5% of the official GDP. Combining this figure to the estimate of underground production which may escape measurement (2.7%) yields 4.2% as the upper limit of the total underground production in relation to the official GDP. Just like the 2.7% estimated in Part II, this estimated total of 4.2% should not be interpreted as:

- a) the actual size of the underground economy;
- b) a comprehensive measure of tax evasion.

The figure of 4.2% is an estimate of the maximum size of the underground economy, not of its actual size. It is an upper limit because a) it was calculated as such; and b) there is a strong presumption that some underground production is in effect double counted,

as part of what may be missing, and as part of what may be captured in GDP. The case in point here is 'skimming', which is calculated as the upper limit of the gross income that all businesses may hide and included in 'potentially' unmeasured production. If the national accounts estimates relied exclusively on declared or reported business receipts, it would be a certainty that no 'skimming' is captured in GDP. But this is not so. For personal expenditure, especially on services, the estimates are based on the Famex. The results of this demand-side survey are not biased downward due to 'skimming'. The higher spending recorded in the Famex translates into higher output in retail trade and services and eventually into higher estimates of net income of unincorporated businesses, thus the gap between the national accounts estimates and the corresponding amounts declared to Revenue Canada.

It is also a partial indication of the importance of tax evasion, which is necessarily expressed in terms of an upper limit: partial, because there are other forms of tax evasion not related to domestic economic production (on capital gains, purchases abroad or government transfer payments); and simultaneously an upper limit with respect to the portion of the tax base coinciding with domestic production, because some of the undeclared income captured in GDP falls below the taxable threshold.

2. Other evidence of the growth of the underground economy

Two other statistical 'gaps' are worth examining to determine if the underground economy has been growing in recent years. The first is the statistical discrepancy between the income and the expenditure estimates of GDP. The other is the difference in the employment figures reported in the Survey of Employment, Payrolls and Hours and in the Labour Force Survey.

2.1 The statistical discrepancy

From 1991 forward, the income-based and the expenditure-based estimates of GDP have not yet been fully balanced and reconciled. Insofar as measured expenditure tends to exceed measured income because the latter is more subject to underestimation due to underground transactions, an increasing imbalance between the two sides of GDP

1. The national accounts estimate of the net income of unincorporated construction firms, shown in Table 2, is almost three times as large as the corresponding amount declared to Revenue Canada for 1991, \$3.5 billion against \$1.2 billion.

Table 18. Total Statistical Discrepancy as a Percentage of GDP

		SD	GDP	SD/GDP			SD	GDP	SD/GDP
		millions of dollars		%			millions of dollars		%
1986	I	2,032	497,088	0.4	1990	I	2,300	668,732	0.3
	II	3,484	502,808	0.7		II	-476	671,352	-0.1
	III	1,380	508,640	0.3		III	1,752	673,000	0.3
	IV	-428	514,128	-0.1		IV	3,240	670,724	0.5
	Year	1,617	505,666	0.3		Year	1,704	670,952	0.3
1987	I	1,868	530,248	0.4	1991	I	5,220	667,372	0.8
	II	4,196	543,620	0.8		II	5,240	676,868	0.8
	III	2,648	558,376	0.5		III	6,996	678,844	1.0
	IV	4,968	574,144	0.9		IV	5,836	680,628	0.9
	Year	3,420	551,597	0.6		Year	5,823	675,928	0.9
1988	I	-764	587,496	-0.1	1992	I	6,352	683,872	0.9
	II	-5,464	599,988	-0.9		II	5,068	685,388	0.7
	III	-3,824	611,500	-0.6		III	5,688	688,428	0.8
	IV	-5,844	624,640	-0.9		IV	6,568	696,476	0.9
	Year	-3,974	605,906	-0.7		Year	5,919	688,541	0.9
1989	I	-6,416	636,276	-1.0	1993	I	4,188	700,180	0.6
	II	-2,912	647,892	-0.4		II	4,160	708,872	0.6
	III	4,160	656,780	0.6		III	4,644	712,840	0.7
	IV	3,560	662,044	0.5		IV	5,900	721,000	0.8
	Year	-402	650,748	-0.1		Year	4,723	710,723	0.7

SD: Statistical discrepancy.

Source: *National Income and Expenditure Accounts*, Catalogue No. 13-001.

could be interpreted as an indication that the underground economy has been growing in the last three years.

This would indeed seem to be the case, as can be seen in Table 18. The total statistical discrepancy (calculated as the expenditure estimate less the income estimate, a minus sign indicating a higher income estimate) has increased as a proportion of GDP from 0.1% per quarter on average during the period 1986-1990 to 0.8% per quarter since then.

A growing underground production is not the only possible explanation of the phenomenon, and the estimates from 1991 to 1993 are still preliminary, but the evidence is suggestive. The total discrepancy jumped from \$1.7 billion in 1990 to \$5.8 billion in 1991, and has remained at a high level since. The total discrepancy was also high in 1987, at \$3.4 billion, and remained high in 1988 at \$3.9 billion, but whereas the income-based estimate was lower in 1987, it was the opposite the following year, suggesting that part of the problem is due to the timing of transactions. In contrast, measured expenditures have now been higher than measured income for fourteen consecutive quarters, which is unusual.

Given that a more 'normal' discrepancy would range between \$1 and \$2 billion, underground production could easily have grown by \$3 to \$4 billion since 1990, on a GDP of about \$700 billion. This would be apart from any increase not captured at all by the national accounts, when underground activity is missed on both sides at the same time, which, as has been indicated, is probably the more common measurement problem.

2.2 Employment: Labour Force Survey versus Survey of Employment, Payrolls and Hours

Statistics Canada publishes two estimates of employment. The first is drawn from the LFS, a monthly sample of about 60,000 households, which serves to establish the size of the labour force, employment, unemployment and the unemployment rate. The other estimate comes from the Survey of Employment, Payrolls and Hours (SEPH), also monthly, which collects data from all business establishments with more than 200 employees (about 30,000), and from a sample of 28,000 establishments with fewer than 200. Since the inception of the SEPH

Table 19. Paid Employment: Labour Force Survey versus Survey of Employment, Payrolls and Hours

	91:1	91:2	91:3	91:4	92:1	92:2	92:3	92:4	93:1	93:2	93:3	93:4
	thousands of workers, seasonally adjusted											
1. LFS ¹	10,732	10,774	10,779	10,722	10,638	10,601	10,633	10,639	10,640	10,661	10,727	10,741
2. SEPH	10,424	10,247	10,170	10,087	9,997	9,981	9,928	9,904	9,961	9,976	9,961	9,953
3 Gap (1 - 2)	308	527	609	635	642	620	706	735	679	684	766	787

LFS: Labour Force Survey; SEPH: Survey of Employment, Payrolls and Hours.

Note 1: Paid workers except in agriculture, fishing, religion and private households, less working proprietors without paid help and workers on unpaid absence; multiple job holders are counted twice.

Sources: LFS, SEPH, and national accounts.

in January 1983, the LFS estimate of the number of paid workers has always exceeded the SEPH estimate of employment, with the gap fluctuating between 0.5 million and 1.1 million on a seasonally adjusted basis.

A large part of the gap results from a broader definition of employment and a more extensive coverage in the LFS. For instance, the LFS treats self-employment as part of employment, whereas the SEPH does not. The LFS also counts as employed, workers on unpaid absence (e.g. strike, maternity leave), covers some industries (agriculture, fishing) left out of the SEPH, and so on. One last major difference goes in the opposite direction: the SEPH counts jobs and the LFS counts job holders. Once these differences are accounted for (by removing from the LFS working proprietors without paid help, workers on unpaid absence and those in industries not covered in the SEPH and adding second jobs held by multiple job holders), the gap in employment between the two surveys is smaller, as shown in the table below.

Many factors contribute to the remaining portion of the gap. Periodic updates to the sample frame of the SEPH lag the actual 'birth' and 'death' of businesses, which may have a significant impact in times of rapid expansion or contraction of the economy. Increased reliance on casual and part-time help might also be an explanation, if employers do not keep the same kind of records for these employees, many of whom may have earnings below the threshold for tax remittance. Finally, part of the gap could be due to underground employment.

A business survey like the SEPH will seldom if ever measure underground employment, but a household survey like the LFS might capture some of it, although certainly not all. On the one hand, people working in the underground economy might declare themselves employed or self-employed in response to the LFS

even if that work is off the books. On the other hand, welfare or unemployment insurance recipients working underground may not report accurately to the LFS for fear of losing their benefits even though such a fear is unfounded since the survey is confidential. Nevertheless, an increase in the gap in favour of the LFS might be indicative of growing underground employment. It is worth noting that this gap can only give an indication of hiring off-the-books, and by extension, of wages paid under the table. It will not capture 'skimming' or other forms of undeclared net business income.

The adjusted LFS-SEPH gap in employment of paid workers has increased substantially over the past three years, from 308,000 on average in the first quarter of 1991 to 787,000 in the fourth quarter of 1993, close to or exceeding 700,000 since the second half of 1992. By contrast, from the inception of the SEPH in 1983 to 1991, it had averaged around 340,000 annually, exceeding 450,000 only once, in the third quarter of 1983.

This recent increase in the gap must be interpreted with caution. Most of the gap is probably due to SEPH-LFS methodological differences for which survey results cannot be adjusted, and to specific measurement problems in SEPH which may have worsened with the last recession. In particular, the SEPH sample may not be large enough to accurately measure employment in small businesses and there are difficulties in identifying turnover in the universe of small businesses which the SEPH is sampling.

These problems will be partly rectified starting with the April 1994 reference month when the SEPH begins to use administrative data from Revenue Canada's PD7A forms. These forms are completed monthly by all businesses with average monthly remittances of less than \$15,000 for income taxes and contributions to unemployment insurance and the Canada Pension Plan. They show both employment

and payroll for the period. Revenue Canada started collecting this information in January 1993. Preliminary results indicate that employment in these small businesses is 250,000 to 300,000 higher than currently estimated through SEPH. In other words, measurement problems relating to small businesses alone account for about half of the gap between the LFS and SEPH. Similar problems likely lead to some underestimation of employment in medium-size businesses (those with 50 to 200 employees) as well.

The 'unexplained' gap is still currently in the neighbourhood of 400,000 jobs. If half of it reflected underground employment, and if one accepts the assumption that underground work is typically part-time, say sixteen hours a week (the current average for part-time work), undeclared wages might add up to \$1.6 billion ($200,000 \times \$10 \text{ an hour} \times 16 \text{ hours} \times 50 \text{ weeks}$), or 0.4% of labour income and 0.2% of GDP in 1993. Modifying the assumptions to full time work (40 hours a week) and \$20 an hour would yield \$8 billion, or 1.1% of GDP. This proportion is virtually the same as the upper limit estimated by Berger through an entirely different approach for wages paid off-the-books, 1.1% of GNP, in 1981 (see section 1.1 just above).

2.3 Summary

The evidence that has been garnered so far from the national accounts and other official statistics to the effect that the underground economy has been growing in importance in recent years is not that strong. The clearest indication of a growing underground economy is the trend in the statistical discrepancy between income-based and expenditure-based estimates of GDP since 1991. Measured expenditure in GDP has now exceeded measured income for fourteen quarters, and the total statistical discrepancy has averaged about \$5 billion per quarter during that period (Table 18). The gap in net income (excluding income from agriculture) between the national accounts estimates and Revenue Canada figures jumped by 1.2 billion in 1991 (Table 17). On the basis of these figures, the portion of the underground production which is captured in GDP may have grown by as much as \$3 or \$4 billion since 1990.¹ What is probably most significant is that all signs point consistently in the

expected direction, at times increasingly so: measured expenditure is higher than measured income in GDP, national accounts estimates of income are higher than corresponding figures declared to Revenue Canada, and measured employment is larger in the LFS than in the SEPH.

In addition, there is also some evidence, although not conclusive, of growing underground transactions in residential construction: the proxy ratio of material inputs to output increased markedly in 1991, and again in 1992 (Table 1). As sales of building materials are well captured, these higher ratios may indicate that some value added (wages and profit) is escaping measurement in those two years, perhaps as much as \$1 billion. Finally, tobacco and alcohol smuggling have grown. The estimated contraband sales of Canadian tobacco, in volume, went from 1.8 billion cigarettes in 1990 to 15.6 billion in 1993 (Table 6).² The effect on GDP of underground transactions related to tobacco is presently estimated at \$423 million for 1992 and \$747 million for 1993 (Table 7). There are no comparable figures over time for alcohol, but the increase in seizures and the fairly pronounced decline in legal sales of spirits since 1989 (Table 8) suggest strongly that alcohol smuggling is escalating.

All told, when the growth in underground production which may be captured in GDP (as indicated by the trend in the statistical discrepancy and in the gap in net income) and that which is missing, whether evident (tobacco smuggling) or suspected (alcohol smuggling and construction) are both taken into account, the total increase in underground production may have reached as much as \$4 or \$5 billion since 1990. These figures are much lower than other ones which have been put forward, but are nevertheless substantial.³

2. The major reduction in tobacco taxes that came into effect in February 1994 has greatly curtailed tobacco smuggling.

3. François Vaillancourt, from the Department of Economics of the Université de Montréal, puts the underground economy (in which he includes illegal activities) at between 4% and 8% of GDP in 1981, 5% and 10% in 1986, 7% and 13% in 1990, and 9% and 16% in 1991 (*Les Affaires*, October 23, 1993). Such results imply that economic growth was understated by 2 percentage points in 1991, and that there was no recession. The claim of the Canadian Federation of Independent Business [1993], in a presentation to a committee of the Ontario Legislature (October 28, 1993), that "growth in the underground economy in Canada during the past three years has been in the order of \$40 billion" carries the same implication. Peter Spiro [1993] put forward the more reasonable estimate of a \$5.7 billion understatement of GDP in 1992, which would be in addition to the \$3 to \$4 billion increase suggested by the trend in the statistical discrepancy.

Even if underground production were growing rapidly however, this would not necessarily translate into an increasing imbalance between revenues and expenditures as measured in GDP. Because GDP is estimated through three different approaches and the three resulting estimates are brought into balance, most of what currently escapes measurement on account of underground transactions is missing in all three estimates, and does not lead to a major discrepancy between them. In addition, any large shift toward underground transactions in areas such as rental of dwellings, new residential construction and home renovation where national accounts estimates are already fairly complete would go unnoticed in GDP. In other words, if the increase in underground transactions is concentrated in areas where their existence does not lead to measurement errors in the first place, no imbalance will result in GDP. It would, however, lead to an increasing gap between income measured in GDP and that declared to Revenue Canada. This is why the judgment to the effect that underground production has not increased by more than \$5 billion might conceivably be altered when the Revenue Canada figures become available for 1992 and 1993.

IV. The size and growth of the underground economy, revisited

1. Underground production: an industry perspective

The estimates presented so far in relation to the underground economy have been in current dollars, and expressed as a percentage of GDP at market prices. We now turn to the third measure of GDP, calculated as the sum of the value added (returns to labour and capital) by all industries. Table 20 presents the GDP at factor cost, or the value added at 1986 prices, and in percentage of the total for some 40 industrial aggregates and sub-aggregates in the recent period.¹ The qualifier 'exposure' in the table denotes industries known or believed to be exposed to underground activity.

The production of the exposed industries, overwhelmingly, is not underground. The figures in Table 20 are estimates of the value of production as measured in the national accounts. With a few exceptions (construction in general, owner-occupied dwellings and services provided by domestic servants) where the gross output and the value added are measured from the demand side (as described in Part II, section 2 in the case of residential construction), the estimates are calculated from the supply side, with data supplied by businesses themselves (and governments), through surveys, censuses, administrative records, etc. These figures largely reflect the 'above ground' economy. Some underground activity is captured in these estimates, as we have just seen, but it makes up at the most 1.5% of total measured activity. The question is the following: can total underground activity (both measured and unmeasured in GDP) amount to a significant proportion of total activity?

First, most industries are either not exposed at all, or very little, to underground activities. This is the case

for forestry, mining, almost all of manufacturing, non-residential construction (plants, shopping malls, offices, warehouses, towers, roads, dams, sewers and sewage treatment plants, hydro plants and transmission lines, oil and gas refineries, oil drilling, pipelines), most of transportation (air, rail, intercity and urban transit, pipeline), communications (telephone, cable, radio and television), other utilities (electricity, gas and water), finance and real estate (banks, trusts, credit unions), insurance, education, health and government services. Underground activity does not affect regulated industries, those in the public sector and those in which very large businesses predominate. These industries account for roughly 75% of all economic activity in Canada, in terms of value added as well as gross output (not shown here), whether in current or in constant dollars.

The remaining industries are exposed to some underground activity. But the bulk, even the overwhelming proportion of the other 25% of economic activity is not underground. If that underground activity were anything but marginal, it would be noticed, as in the case of tobacco and alcohol smuggling. For example, let us consider retail trade. Most consumer goods are not purchased under the table, but from very large retail businesses, often grouped in nation-wide chains (food stores, department stores, pharmacies, home and auto supply stores), that are unlikely to hide their receipts. Declared receipts of firms with annual sales over \$1 million totalled \$144 billion, or 78% of the total of \$184 billion in 1992, leaving \$40 billion for declared receipts of small firms.² Even if this figure were understated by 50%, or \$20 billion, due to skimming (and we have shown in Table 5 that a 15% understatement of gross receipts in retail trade implied a 70% understatement of true net income), retail sales would still be understated by only 10%.³

The same can be said about residential construction (new residential construction proper and renovations), which makes up roughly 1.5% of GDP in terms of value added (Table 20). In other words, the 150,000 or so housing starts a year in Canada plus all the spending on renovations translate into 1.5% of GDP.

1. The monthly estimates of GDP by industry, from which Table 20 is derived (by aggregating estimates for the business and the 'non-business' sectors), are only calculated in constant prices, for which the base year is currently 1986. The shares of various industries in GDP are very similar in current or in constant dollars. Estimates of value added by industry in current dollars have been calculated using the input-output tables only up to 1990 (see *The Input-Output Structure of the Canadian Economy*, Catalogue No. 15-201).

2. See the section on skimming (Part III, 3.1) for an explanation of the difference between these numbers and those appearing in Table 4.

3. Although if all this \$20 billion translated into value added, in other words, if firms managed to hide \$20 billion in sales without hiding any intermediate expenses, GDP would be underestimated by almost 3%.

Table 20. GDP at Factor Cost by Industry, at 1986 Prices, 1990 to 1992

Industry	1990	1991	1992	1990	1991	1992	Exposure ¹
	millions of dollars			percentage			
Agriculture and related services	11,717	11,595	11,025	2.3	2.3	2.2	
Fishing and trapping	1,062	964	822	0.2	0.2	0.2	
Logging and forestry	3,351	3,085	3,332	0.7	0.6	0.7	
Mining, quarrying and oil wells	19,576	19,842	20,070	3.9	4.0	4.0	
Manufacturing	93,348	87,911	88,107	18.5	17.6	17.5	
Of which, tobacco products	607	603	567	0.1	0.1	0.1	
Of which, distilleries and wineries	426	378	344	0.1	0.1	0.1	yes
Construction	32,498	31,090	29,034	6.4	6.2	5.8	
Residential construction	8,701	7,295	7,616	1.7	1.5	1.5	yes
Non-residential building construction	7,610	7,061	5,872	1.5	1.4	1.2	
Other construction	16,187	16,734	15,546	3.2	3.4	3.1	
Transportation and storage	24,199	23,655	23,847	4.8	4.7	4.7	
Transportation	20,731	19,965	19,729	4.1	4.0	3.9	
Of which, truck transport	6,303	6,187	6,435	1.2	1.2	1.3	yes
Pipeline transport	2,865	3,047	3,482	0.6	0.6	0.7	
Storage and warehousing	602	643	635	0.1	0.1	0.1	yes
Communications	17,928	18,665	19,063	3.6	3.7	3.8	
Other utilities	15,628	16,094	16,179	3.1	3.2	3.2	
Finance, insurance and real estate	78,169	81,123	83,943	15.5	16.3	16.7	
Finance and real estate	34,281	35,527	36,738	6.8	7.1	7.3	
Insurance	4,034	4,178	4,267	0.8	0.8	0.8	
Government royalties on resources	4,400	4,511	4,784	0.9	0.9	0.9	
Owner-occupied dwellings	35,454	36,908	38,154	7.0	7.4	7.6	
Wholesale trade	28,083	28,186	30,254	5.6	5.6	6.0	yes
Retail trade	30,633	29,369	29,913	6.1	5.9	5.9	yes
Community, business & personal services	115,381	113,750	114,005	22.9	22.8	22.6	
Business services	22,679	22,071	21,408	4.5	4.4	4.3	
Of which, miscellaneous services	7,322	6,828	6,783	1.5	1.4	1.3	yes
Of which, professional services	10,406	10,210	9,373	2.1	2.0	1.9	yes
Educational services	27,306	27,783	28,304	5.4	5.6	5.6	
Health services	32,084	32,299	32,579	6.4	6.5	6.5	
Accommodation and food services	12,417	11,069	11,186	2.5	2.2	2.2	yes
Amusement and recreational services	5,417	5,258	5,313	1.1	1.1	1.1	yes
Personal and household services	8,696	8,628	8,473	1.7	1.7	1.7	
Non-profit organizations	2,391	2,379	2,458	0.5	0.5	0.5	
Other personal and household services	6,306	6,249	6,015	1.2	1.3	1.2	yes
Other services	6,782	6,641	6,742	1.3	1.3	1.3	yes
Government services	33,216	33,604	34,041	6.6	6.7	6.8	
Total economy	504,787	498,932	503,637	100.0	100.0	100.0	
Sub-total, exposed industries	123,398	118,313	120,609	24.4	23.7	23.9	

Note 1: Denotes possible exposure to underground activity.

Source: *Gross Domestic Product by Industry*, Catalogue No. 15-001, and National Accounts.

But let us assume for a moment that half of the true gross output, not of the value added, of that industry is not only underground, but entirely missing from GDP (i.e. that there exists a hidden output equal the measured output of \$30.9 billion excluding taxes as shown in Table 1, line 12). But for this assumption to be plausible, one would have to 'find' somewhere the building materials making up on average 56% of that output, or \$17.3 billion, which are not recorded in inventories, production, imports or sales, and not reported by consumers as having been purchased either. The material inputs of construction, by and

large, are not missing in GDP and neither are the service inputs (9%). If anything is missing, it is the difference between the gross output and the inputs, that is, the valued added (wages and profits) making up the other 35%. The far fetched assumption that another 150,000 housing starts and as much spending on renovations as the amount already recorded might somehow have been overlooked would still add only 35% of the additional output, or 1.5%, to GDP, equivalent to the wages and profits already recorded for residential construction.

In the same vein, all legally operating distilleries and wineries together (the only ones of which the activity is recorded in GDP in this instance) account for less than 0.1% of the total economic activity. There is apparently some illegal wine manufacturing, but even if this activity was as important as all the legal wine and alcohol manufacturing in the country (clearly it is not), it would amount to less than 0.1% of GDP.

Total underground activity (both captured in GDP and missing) cannot be measured explicitly, nor can it be expressed precisely as a share of GDP (total recorded economic activity). However, since, broadly speaking, such activity cannot amount to more than a fraction, perhaps 10% at the outside,¹ of the measured activity of the exposed industries, which themselves only account for 25% of GDP, it follows that total underground activity could hardly add up to much more than 2.5% of GDP.

2. The underground economy in terms of employment

So far, the underground economy has been examined in terms of expenditures (Part II) and incomes (Part III). It can also be analyzed in terms of employment. There are three broad types of activities in the underground economy: smuggling, skimming of receipts by legitimate businesses, and underground production as narrowly defined, namely production undertaken by individuals without a business address who do not declare any income from their underground activity, such as home renovation, childcare and household services. How many people would have to be working in the underground economy to produce the equivalent of 15% of the measured GDP, a figure which some observers have cited?²

1. Except possibly in residential construction, where most of the activity is captured in GDP even if unreported or undeclared, as well as accommodation and food, amusement and recreation, and other personal and household services, where part of the undercoverage in GDP simply results from the lack of survey data as much as from underreporting, a 10% share for underground activity in an industry would very likely be too high.

2. In a recent paper, Karoleff, Mirus and Smith [1993] reported updated estimates based on a money demand approach suggesting the size of the underground economy in 1990 was between 15% and 22% of GDP. The Canadian Federation of Independent Business, in the presentation quoted above, refers to 15% as a 'consensus' figure and states that an estimate of \$110 billion "is consistent with CFIB estimates", without explaining how this figure was derived.

If the bulk of what is missing from GDP comes from skimming of business receipts, then no employment is required to produce another 15% of GDP. It would already have been 'produced', only completely off the books. However, as we have demonstrated (Part II, section 2.1), even on the basis of extreme assumptions, skimming of receipts could have amounted to no more than \$10.8 billion in 1992, or 1.5% of GDP. For the underground economy to represent up to 15% or 20% of GDP, some people must be working underground, producing these goods and services.

For 1992, GDP was estimated at \$601 billion of factor incomes, plus \$85 billion of indirect taxes net of subsidies, plus \$3 billion as the statistical discrepancy, for a total of \$689 billion at market prices. This represents a value added, in the form of wages, investment income, profits and net income of unincorporated business, of \$49,100 per person employed ($\$601 \text{ billion} / 12,240,000^3$). If one assumes an identical value added per person employed in the underground economy, in other words, the same productivity in both the 'above ground' and the underground sectors, a production 15% larger would require 1.8 million more people than the number presently counted as employed.

Perhaps the assumption of equal productivity is unrealistic. The sale of contraband cigarettes is very lucrative, and probably yields a much higher value added per person involved. If one assumed instead that the productivity or the value added in the underground sector were twice the average, this would still imply 0.9 million people employed in the underground economy. But this assumption is hardly tenable in the case of the activities other than smuggling commonly associated with the hidden economy, such as child care, hairdressing and home renovation, which are conducted on a small scale, are not highly capitalized⁴ and do not yield much value added.

More plausibly therefore, not all underground activities are as lucrative as tobacco smuggling. Furthermore, if the survey evidence is to be believed

3. All figures on labour force, employment and hours worked come from the Labour Force Survey.

4. By comparison, the stock of non-residential structures (offices, stores, factories, warehouses, refineries) and machinery and equipment (furniture, computers, trucks, industrial machinery, farm machinery) in use in the 'above ground' economy is valued at \$909 billion (\$682 billion for structures and \$227 billion for equipment) at replacement cost for 1992, or \$74,300 per person employed. See *National Balance Sheet Accounts*, Catalogue No. 13-214).

(see section 5 below), many people with regular employment supplement their income by being self-employed in underground activities on a part time basis. If this is the case, then it is far more likely that the value added per person involved in underground activities is much less than \$49,100. On the assumption that it is half that, on average, this implies, for an underground economy of 15% of GDP, the involvement of 3.7 million people. This figure does not refer to the number of people purchasing goods and services in the underground economy, which is conceivable, but to those involved in their production.

An underground work force of 3.7 million is the equivalent of 27% of the measured labour force in 1992. This does not mean that 27% of the labour force has to be employed in underground activities part-time or full-time, since it is not known whether those working underground are counted in the labour force or not. But the civilian, non-institutionalized population aged over 15 years was 21.3 million (in 1993), from which must be deducted a total of 5.3 million persons not likely to be much engaged in underground work (1.9 million persons aged over 69, 1.6 million retired persons aged between 50 and 69, 1.4 million full-time students and 400,000 persons permanently unable to work). This leaves a reservoir of 16.0 million people, from which 3.7 million, or 23%, would have to be working some way or other in the underground economy.

For the sake of argument, let us assume that the most plausible scenario is that a) the productivity is the same in both the 'above ground' and the underground sectors, b) the official estimate of employment of 12.2 million persons is essentially correct and c) the underground economy represents 15% of GDP. As we have seen, this implies 1.8 million persons employed in the underground sector. Let us assume further that all these persons are already employed in the regular economy, full-time or part-time. The implications for average productivity and hours worked are staggering. According to the LFS, the 12.2 million people employed worked 20.4 billion hours in 1992. To increase this figure by 15%, i.e. 3 billion hours, the 1.8 million people already working full-time or part-time would have to work on average 33 hours a week during 50 weeks a year in the underground economy.

Alternatively, let us assume that the people working in the underground sector are not among the 12.2 million already employed in the 'above ground' sector, but, more likely, are the ones that are counted as not presently working (either unemployed or not in the

labour force). Then, the 3 billion hours of work needed to produce goods and services worth an additional 15% of GDP would translate into 1.5 million full-time jobs a year (on the basis of 40 hours a week times 50 weeks), roughly the equivalent of the official estimate of unemployment, or into 5 million part-time jobs.

The work force engaged in underground activities is made up of a combination of people in the labour force (full-time and part-time workers, self-employed and employed in the regular economy, and unemployed) and not in the labour force (i.e. not seeking work). But whatever the true composition of underground employment, for the value added in the underground economy to represent 15% of GDP, total employment, total labour force and the labour force participation rate (labour force as a percentage of the working age population) would have to be much higher than what is suggested by present statistics (Table 21).

At the limit, the true labour force participation rate would be around 75% instead of 66%, which is extremely high. Since labour force participation changes gradually, this would be conceivable only if the underground economy had been very large in relation to the regular economy for decades, and official estimates of the labour force and employment had been understated considerably and consistently.

But the monthly Labour Force Survey, with a current sample size of 58,000 households (about 110,000 persons), is very unlikely to undercount the labour force by much. In response to the LFS, many of those involved in underground activities will declare themselves employed, self-employed or unemployed, in which case they will be counted in the labour force. If, quite plausibly, they are among non-respondents, an imputation will be made in their case on the basis of the average response like in all other surveys and, consequently, about two-thirds of them will also automatically be counted in the labour force.¹

If, on the contrary, the supposedly large and rapidly growing number of those involved in underground activities declare themselves 'not in the labour force', then the measured labour force participation and employment rates should be decreasing significantly. Yet over the past 15-20 years, the participation rate has increased steadily, as can be seen from the Table 21. It reached a peak in 1990 and has decreased since due to the recession, but not in a proportion

1. The rate of non-response to the LFS is about 5% and is not on the increase.

Table 21. Population, Labour Force, Employment and Unemployment, 1976-1993

	1 Population, 15 years and over	2 Labour Force	3 Employment	4 Unemployment	5 Participation Rate (2 / 1)	6 Employment/ Population (3 / 1)
	thousands				percent	
1976	16,701	10,203	9,477	726	61.1	56.7
1977	17,051	10,500	9,651	849	61.6	56.6
1978	17,377	10,895	9,987	908	62.7	57.5
1979	17,702	11,231	10,395	836	63.4	58.7
1980	18,053	11,573	10,708	865	64.1	59.3
1981	18,368	11,899	11,001	898	64.8	59.9
1982	18,608	11,926	10,618	1,308	64.1	57.1
1983	18,805	12,109	10,675	1,434	64.4	56.8
1984	18,996	12,316	10,932	1,384	64.8	57.5
1985	19,190	12,532	11,221	1,311	65.3	58.5
1986	19,397	12,746	11,531	1,215	65.7	59.4
1987	19,642	13,011	11,861	1,150	66.2	60.4
1988	19,890	13,275	12,245	1,031	66.7	61.6
1989	20,141	13,503	12,486	1,018	67.0	62.0
1990	20,430	13,681	12,572	1,109	67.0	61.5
1991	20,746	13,757	12,340	1,417	66.3	59.5
1992	21,058	13,797	12,240	1,556	65.5	58.1
1993	21,392	13,946	12,383	1,562	65.2	57.9

Source: Labour Force Survey; annual averages.

large enough to suggest that the 'true' rate could be 10% to 15% (6 to 9 points) higher.

The ratio of employment to population also peaked in 1989 just before the recession. Average employment, on an annual basis, peaked in 1990. A phenomenon of similar magnitude was observed in the previous recession, when employment (expressed as an annual average) did not exceed its pre-recession peak until 1985. The work in the underground economy could be done, of course, by people counted as not employed. As we have shown, however, an underground economy equivalent to 15% of GDP translates into 1.5 million full-time jobs or 5 million part-time jobs.

A significant part of the drop in the labour force and in employment, if not all, must be attributed to the recession. Total employment shrank by about 350,000 between 1990 and 1992. *If these 350,000 people had all found full-time work (40 hours a week) in the underground economy for the whole year (50 weeks) at \$10 an hour (well above the minimum wage), they would have earned \$7 billion, 1% of GDP.*

3. The size of the underground economy in relation to the size of the small business sector

Apart from what can be inferred from the industrial distribution of GDP and employment, there is one other way to deal with this very difficult question through statistics, and that is to look at the overall share of small businesses in the economy. It goes without saying that businesses with hundreds of employees cannot go unnoticed. Even the huge majority of businesses between say 20 and 100 employees are probably registered with Revenue Canada, and thus with Statistics Canada. How many small businesses would have to be missed by the statistical system to add up to a sizeable share of economic activity?

The question can be addressed by estimating the share of total activity, or GDP, accounted for by small businesses, defined as before as all unincorporated businesses plus all incorporated businesses with annual sales below \$1 million, to which will now be added all self-employed individuals (professionals, fishermen, farmers, commission earners and unincorporated landlords). Taxation data can be used to this end, even though they reflect the 'above ground' economy. In 1991, declared gross business income of all corporations amounted to \$1,242 billion,

Table 22. Share of Small Businesses in the Private Business Sector, 1991

	Gross income of firms				Number of firms		
	All	Medium and large	Small	Small / All	All	Medium and large	Small
	billions of dollars			percentage	thousands		
1. Incorporated businesses	1,242	1,112	130	10.5	886	108	778
2. Unincorporated businesses	50	-	50	100.0	648	-	648
3. Self-employed individuals (uninc.) ¹	69	-	69	100.0	538	-	538
4. Total	1,361	1,112	249	18.3	2,072	108	1,964

Note 1: The gross income pertains to income from farming, fishing, professions, commissions and rent; however, individuals with rental income are not counted in the number of firms.

Sources: Statistics Canada, Business Register Division, taxation data files, and Revenue Canada, *Taxation Statistics*.

and that of small ones, to \$130 billion. For unincorporated businesses and self-employment, the figures were respectively \$50 billion and \$69 billion.¹ Small businesses and self-employed individuals thus accounted for about 18% of total gross business income. Their share of the GDP of the private business sector cannot be precisely established, but if gross business income is any indication, it should range between 15% and 20%.

The share of small businesses in total GDP cannot be calculated directly. However, the business sector as defined in the national accounts, that is, including government business enterprises, generates 82% of GDP, and private businesses themselves, 79%.² On the basis of the gross income shown in Table 22 above, the 79% share of the private business sector in GDP can be distributed between the various sub-sectors as shown in table 23. Small businesses thus account for about 14% of GDP.³

The point is this: *for underground transactions to represent 15% of GDP in Canada, the underground sector would have to be as large as the small*

business sector. This small business sector which generates at the most 15% of 'above ground' economic activity is made up of 778,000 small corporations (of which 264,000 have an annual income below \$25,000 or no income), 648,000 unincorporated businesses (of which 250,000 have no taxable income), and 538,000 self-employed individuals (of which 146,000 have no taxable income), not counting landlords (although rental income is included),⁴ for a total of 2.1 million business entities (of which 660,000 have little or no income), all of whom are registered with and filed a tax return with Revenue Canada in 1991.

Not a single corporation is missing from that small business universe, since all corporations are, by law, registered with Revenue Canada. To be incorporated is to be registered. Among the 538,000 self-employed individuals, 245,000 are farmers. It is difficult to hide a farm and a census of agriculture is carried out every five years.⁵ Another 207,000 are professionals (doctors, lawyers, accountants), most of whom are registered with their professional association and with the government. The number of other unincorporated businesses could be seriously understated,

1. We were able to quote 1992 figures in Part III, section 1.3, because the taxation data file containing the gross business income of corporations is available. However, with respect to unincorporated firms, the most recent information on gross income other than from business, namely from professions, commissions, farming, fishing and rent, pertains to 1991. Using data for 1992 would hardly alter the results.

2. In the national accounts, the business sector includes private enterprises as well as government-owned enterprises. The non-business sector refers to the government sector narrowly defined (administration, education and health) plus the personal sector (universities, churches and other non-profit organizations). See Catherine Bertrand, "The Distribution of GDP at Factor Cost by Sector", *National Income and Expenditure Accounts*, Catalogue No. 13-001, third quarter 1993. See also *Gross Domestic Product by Industry*, Catalogue No. 15-001, for the monthly estimates of GDP in constant prices for the business and non-business sectors.

3. Even that share may be overstated somewhat because the gross income of unincorporated partnerships may be counted as many times as there are partners in the *Taxation Statistics*. The overstatement also affects the number of businesses, but not the net income. A comparison of the 'edited' taxation data files of the Business Register Division with the *Taxation Statistics* suggests that it could be as much as 10%.

4. Individuals classified as 'property owners', 173,000 in the 1991 *Taxation Statistics*, represent only a fraction of all landlords, who are classified as 'property owners' only if net rental income constitutes the major portion of their 'total income assessed'. All others are classified as 'employees', 'self-employed professionals', etc. on the basis of their major source of income and their number cannot be determined.

5. The average area of Canadian farms was 242 hectares (598 acres) in 1991 (Census of agriculture).

Table 23. Percentage Distribution of GDP at Factor Cost by Sector and Sub-sector of the Economy, 1991

	Percent	Underground production
Business sector:		
Government business enterprises ¹	3	None
Private business enterprises:		
Medium and large corporations	65	Virtually none
Small businesses:		
Small corporations	7	Small
Unincorporated self-employed individuals ²	4	Small
Other unincorporated businesses	3	Significant
Sub-total, small businesses	14	
Sub-total, private business enterprises	79	
Total, business sector	82	
Non-business sector:		
Governments	16	None
Personal sector ³	2	None
Total, non-business sector	18	
Total economy	100	

Note 1: Via Rail, CBC, Ontario Hydro, Manitoba Telephones, local transit companies, etc.

Note 2: Farmers, fishermen, professionals (doctors, lawyers...).

Note 3: Universities, churches, other non-profit organizations.

especially the very small ones. But since the 398,000 unincorporated businesses with taxable income accounted for about 3% of the official GDP, an additional 2 million would be needed to generate economic activity equivalent to 15% of GDP. *It is doubtful Revenue Canada and Statistics Canada would have overlooked 2 million small businesses.*

The 2 million small businesses (not counting unincorporated landlords) already identified represent a ratio of one small business for every five households. At face value, this does not appear like a number which is greatly understated. Even if it were, as can be seen from Table 23, underground production is absent from 21% of the economy (government, government business enterprises and the personal sector), virtually absent from another 65% (medium and large corporations), and not very large in small corporations (all of which are registered and file tax returns) and among farmers and professionals which make up about 80% of the self-employed category. It could only be substantial in other unincorporated businesses which account for 3% of recorded GDP. An underground production as large as recorded production in their case would amount to 3% of GDP.

4. Average household spending in the underground economy

The level of Canada's GDP at market prices was \$711 billion in 1993. An underground economy of 15% of GDP thus represents \$107 billion. Most underground transactions are believed to relate to goods and services sold to households, and there are roughly 10.2 million households. *That works out to purchases under the table of \$10,500 per household, per year.* One household, but not all, may spend that much, or more, for renovations under the table one year, but not every year. Not only is this average amount extremely high, it would have to be spent on the limited range of goods and services that can be purchased under the table. But the overwhelming portion of the household budget is spent on items that precisely cannot be purchased under the table (or if so, only to a very limited extent), such as food, clothing, new cars and trucks, gasoline, mortgage, rent, insurance, fuel and utilities, communications, transit, tuition fees and lottery tickets, to mention only the important ones.

In a poll conducted in November 1993, 33% of respondents acknowledged having paid in cash to avoid sales taxes during the previous twelve months.¹

1. See footnote 4, page 5.

A poll of this kind with a sample of 1,000 respondents is deemed accurate within 3 percentage points. If only a third of households purchase goods under the table, the necessary spending to arrive at 15% of GDP goes up to \$31,500 per household, per year. For comparison, the average family income is estimated at \$53,676 before tax, and \$43,359 after tax in 1992.¹ If, on the other hand, a third of households spent \$2,000 each under the table, a more plausible but still high assumption, this would yield \$6.8 billion, about 1% of GDP.

5. The evidence of direct measurement of the underground economy

The most clear-cut way to determine the scope of underground transactions is through a direct survey of households, asking questions about both the supply and demand sides of the underground market. Such a survey was conducted in Quebec by a group of researchers from Université Laval in 1986.² The anonymous questionnaire was completed by 2,134 respondents.

Some 31% of respondents acknowledged taking part in underground activities, as purchasers, sellers (9% of respondents), or both. The average declared income of those working under the table was half of the income of all those in the sample (\$9,295 against \$20,344), and the average undeclared income was \$2,181, thereby indicating that underground activity was often a part-time, low-income occupation.

The spending categories identified included home construction, renovation and repairs (with over 30% of reported spending), childcare and household services (28% of spending), personal services, professional services, room and board, vehicle and appliance repair, transportation (driving, deliveries, moving), as well as illegal goods and services (gambling, drugs and 'personal encounters', 7% of spending) and a residual category (meals, tutoring..., 16% of spending).

Total spending under the table amounted to 1.4% of Quebec's GDP, under a definition of the underground economy as the market production of goods and

services, whether legal or illegal, that escapes detection by the tax authorities. This direct estimate of 1.4% is conceptually comparable to the *upper limit* of 5.2% arrived at in this study as follows: 2.7% for *unmeasured underground production*, plus 1.5% for *underground production already captured in GDP*, plus 1% for *illegal production*. The direct estimate of 1.4% could be appropriately viewed as the lower bound of the size of the underground economy.

Two reasons explain why the results of such a direct survey may be on the low side. First, it is doubtful whether a household survey can capture a significant proportion of spending on illegal goods and services. More importantly, a direct survey of households is incapable of measuring the skimming of business receipts accurately, much of which goes on without the knowledge of the customers. It will capture some of it (in the instances where the customers are aware of it), but not all.

A similar study with respect to the sample size and the nature of the questionnaire, except that illegal goods and services were left out, was undertaken in the United States in 1981 under the direction of Professor James D. Smith from the Institute for Social Research of the University of Michigan. It came to virtually the same result, that is, 1.4% of GNP for the size of the total (measured and unmeasured) 'informal' economy.³ The three researchers from Université Laval have recently updated their study and now believe that the underground economy (excluding illegal production) could represent 1.5% of Quebec's GDP in 1991.⁴

The direct evidence in those two studies therefore supplements and supports the inferential evidence presented so far. The underground economy may be growing in importance, but all the evidence suggests that total underground production (measured and unmeasured by the national accounts) still represents only a small fraction of GDP.

1. See *Income after tax, distributions by size in Canada*, Catalogue No. 13-210, Table 6.

2. See Bernard Fortin, et al., *Dimensions et caractéristiques des activités économiques non déclarées à l'impôt*, Université Laval, 1987.

3. According to the Internal Revenue Service and to the national accounts of the United States, about \$10 billion of the \$42 billion of informal spending captured in the Michigan study was declared as income and measured in the US GNP. The definition of the informal economy employed was thus larger than our definition of the underground economy, since it includes some income declared to the tax authorities. See James D. Smith [1983-1, 1983-2].

4. See Fortin, et al., "L'économie souterraine au Québec", *Interface*, March-April 1992.

Conclusion

The underground economy and the measured growth of GDP

From a static point of view, it is correct that most underground transactions, if escaping measurement, are likely missed on both sides of GDP, therefore not causing much imbalance between incomes and expenditures, and making them all the more difficult to detect. But the underground economy is not self-contained. There is no separation between the 'above ground' and the underground sectors of the economy. Income earned in one sector is spent in the other and vice versa. As a result, a boom in a 'large' underground sector would necessarily be felt in the rest of the economy. Measured GDP would be growing more than 1% to 2% a year if the underground sector accounted for 15% of activity and was growing by 10% a year. Part of the huge income generated in the underground sector would be in turn spent on goods and services sold in the 'above ground' sector. Housing starts, motor vehicle sales and restaurant receipts would increase. Not much of that was happening in 1991 and 1992.

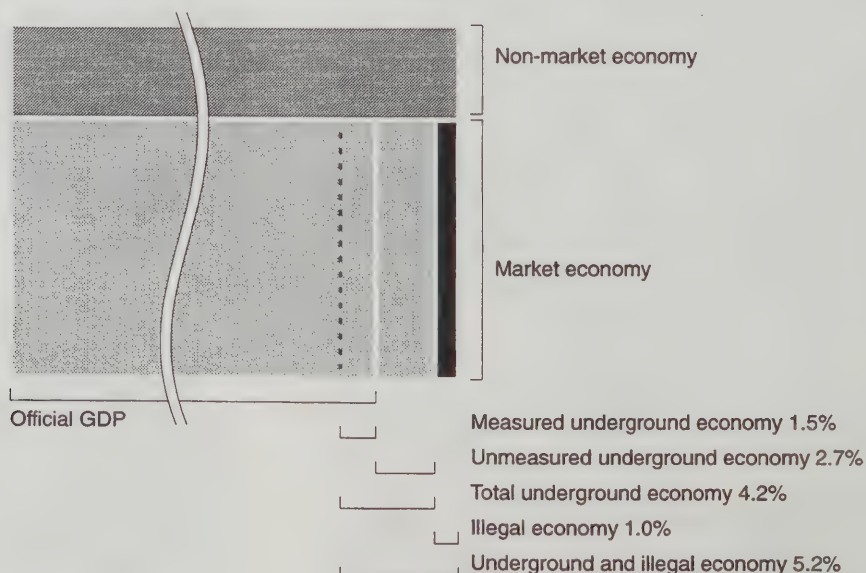
The underground sector would have to represent 5% of GDP, grow three times as fast as the rest of the economy (3% at quarterly rates instead of 1% for

example), and none of that growth show up in the economic statistics used to calculate the official GDP for the growth of total GDP (in both sectors of the economy) to be understated by one tenth of a point. This is about the average revision to the quarterly growth rate of GDP. On the basis of the analysis presented, one may assume that the growth of GDP in Canada is not presently understated in spite of the inability of the statistical system to capture all underground economic transactions.

More importantly, the statistical system is sufficiently developed in Canada that only a very small proportion of the market production of legal goods and services can escape measurement in GDP. Undeclared or unreported transactions cannot go unmeasured by the statistical system any more than they go unnoticed in society.

There are no 'statistics' on the underground economy and there probably never will be. Part of the unreported and the undeclared will always remain unmeasured. However, there are plenty of statistics which do enable the Canadian system of national accounts to determine with some measure of confidence a maximum size of 4.2% for the underground economy as a percentage of GDP, of which about 1.5% would be already measured and the other 2.7%, unmeasured. This upper limit, based on extreme assumptions, should not be taken for the true size of the underground economy in Canada.

The Underground Economy



Appendix I

Why certain components of GDP are not subject to underestimation due to underground production

The estimation of the following components of income-based GDP is not affected by underground transactions: a) supplementary labour income, b) interest and miscellaneous investment income, c) inventory valuation adjustment, d) capital consumption allowances, e) indirect taxes and, f) subsidies.

Supplementary labour income consists of mandatory employer contributions to Canada Pension Plan, unemployment insurance and workers' compensation, and of their non-mandatory contributions to employee pension funds and health and welfare plans. Employers typically pay all or part of premiums for medicare, dental insurance, group life insurance, etc. These are some of the costs which businesses avoid by employing workers on contract or off the books; by definition, production would cease to be underground if such payments were made. They cannot therefore be 'missing' in GDP due to underground economic activity.

In GDP, the overall business operating surplus includes, in addition to corporate profits, three other components: interest and miscellaneous investment income, inventory valuation adjustment and capital consumption allowances, the estimation of which is broadly articulated with that of profits. Because profits are essentially a residual, both in business books and in GDP, any correction to the overall surplus need not translate into anything else but profits, the other three components being largely deducted from the overall surplus to arrive at aggregate profits. Thus, from the point of view of business, *capital consumption allowances* are an expense, not an income. Businesses will overstate them to reduce taxable income, not the opposite. Should they somehow understate them, they would overstate their profits. The same kind of reasoning applies to the *inventory valuation adjustment*, which serves to remove holding gains or losses from corporate book profits. This is a national accounts adjustment, not one calculated or reported by business, like receipts or profit. *Interest and miscellaneous investment income* is made up of two parts. The first, government investment income,

is not subject to hidden transactions. The other part, investment income of persons, refers to transfers from government and business in the form of interest. An understatement here would be offset by an overstatement of corporate profits or net income of unincorporated business.

A good example of that offsetting effect is that of mortgage loans made directly by individuals, without a financial intermediary. The only source of information on interest receipts from such loans are amounts declared to Revenue Canada by individuals, which could be grossly understated. However, as mortgage interest is deducted from gross rents to arrive at net rental income, any underestimation of interest translates here into an overestimation of net rental income which enters net income of unincorporated business. Only the distribution of GDP by source of income would be incorrect in this instance, not the level.

Finally, *indirect taxes* and *subsidies* are not factor incomes. Only the indirect taxes that have been paid to government belong in GDP at market prices, not the ones that have been evaded through underground transactions, or that should have been paid. Subsidies are paid out by government and are not subject to underground transactions.

Similarly, on the expenditure side of GDP, some components are not subject to underground transactions at all, namely *government current expenditure on goods and services* and *government investment*. For other components, underground transactions may be involved, but do not lead to an underestimation of GDP or else have at most a negligible effect. *Business investment in inventories* is an example of the former case, *exports* and *business investment in non-residential construction and machinery and equipment*, examples of the latter.

Business investment in inventories actually refers to the value of the physical change of inventories. It is small in relation to GDP, and negative when inventory reductions occur. Businesses have been known to invent or exaggerate inventory losses in order to reduce taxable income. However, holding gains or losses on inventory are removed in the calculation of inventory change and of business profits as they are not related to current production. Inventory change in GDP is valued at average market prices of the period, not at prices reported by business. The difference between the business valuation and the national accounts valuation becomes the inventory valuation adjustment, referred to earlier, which is offset against profits on the income side of GDP.

Estimates of business investment in non-residential construction (commercial and industrial buildings, roads and other engineering works) and in machinery and equipment (industrial machinery, computers and office equipment, motor vehicles) come from the demand side, through a bi-annual survey in which businesses are asked about their investment intentions, as well as from the supply side, through import documents and surveys of production and sales of machinery and equipment. Supplying businesses may have a motive to hide receipts, but those on the demand side have no interest to hide expenditure. They are usually entitled to input credits on the GST and provincial sales taxes paid in relation to the investment. The business sector, overall, is a net borrower of funds in the economy, and business expansion is generally financed through loans and issue of bonds and equity, all transactions made in the 'above ground' economy. Businesses with a completely hidden production (illegal wine manufacturing for instance) would not be surveyed, but would have to be very small and not require much machinery and equipment to remain hidden, so that their omission would be statistically negligible.

Legitimate businesses may also try to pass off some capital spending (purchases of office equipment for instance) as a current expense in order to reduce their taxable income. This practice could result in tax avoidance, but, like transfer pricing, it is legal and is not a form of underground production.

Appendix II

Potential understatement of personal expenditure due to underground transactions, by category, 1992

		Excluding taxes	Including taxes	Skimming	Other	Total potential understatement	
	Status	\$M	\$M	\$M	\$M	\$M	%
Durable goods:							
New automobiles	A	8,817	10,096				
New trucks and vans	A	4,481	5,099				
Used motor vehicles	B	3,323	3,954	169		169	4.3
Motor vehicle parts and accessories	B	3,077	3,498	594		594	17.0
Motor vehicle maintenance and repair	B	3,612	4,017	842		842	21.0
Furniture	B	4,066	4,630	127		127	2.8
Floor coverings	B	439	499	67		67	13.5
Upholstery and furniture repairs	C	166	183	47		47	25.7
Stoves, ranges and microwaves	B	805	915	15		15	1.6
Washers and dryers	B	597	678	16		16	2.4
Refrigerators and freezers	B	674	766	15		15	2.0
Other major appliances	B	793	900	38		38	4.3
Small electrical appliances	B	859	978	39		39	4.0
Garden tools and equipment	B	509	575	14		14	2.4
Household equipment repairs	B	263	293	43		43	14.7
Television sets, video equipment and accessories	B	2,376	2,695	79		79	2.9
Radios, sound systems and accessories	B	1,192	1,353	41		41	3.0
Sporting and camping equipment	B	1,771	2,016	96		96	4.8
Musical instruments and supplies	B	1,642	1,858	86		86	4.7
Bicycles and motorcycles	B	1,198	1,359	44		44	3.3
Cameras and accessories	B	769	872	36		36	4.2
Office machines and equipment	B	1,228	1,397	21		21	1.5
Boats, motors and accessories	B	632	720	36		36	5.0
Trailers	B	526	594	19		19	3.2
Recreation equipment rentals	B	712	807				
Recreation equipment repairs	B	366	408	61		61	14.9
Watches and jewellery	B	1,784	2,025	121		121	6.0
Watch and jewellery repairs	B	95	107	13		13	12.2
Sub-total, durable goods		46,772	53,292	2,679		2,679	5.0
Semi-durable goods:							
Men's and boys' clothing	B	6,260	7,039	179		179	2.5
Women's, misses' and children's clothing	B	9,844	11,079	279		279	2.5
Dressmaking, repairs and alterations	C	132	145	16		16	11.3
Footwear	B	2,743	3,064	102		102	3.3
Shoe repairs	C	75	84	17		17	20.2
Notions and smallware	B	342	385	15		15	4.0
Piece goods	B	622	700	17		17	2.4
Household textiles and furnishings	B	2,722	3,096	127		127	4.1
Luggage and leather goods	B	171	194	16		16	8.2
China, glassware and crockery	B	1,506	1,708	94		94	5.5
Lamps, fixtures and accessories	B	713	810	29		29	3.6
Silverware and flatware	B	163	185	14		14	7.5
Hardware	B	2,233	2,539	164		164	6.5
Toys, games and hobby supplies	B	1,789	2,030	105		105	5.2
Films and other photographic supplies	B	375	426	14		14	3.3
Stationery, books, newspapers and magazines	B	4,067	4,435	227		227	5.1
Pets and supplies	B	103	117	15		15	12.5
Sub-total, semi-durable goods		33,860	38,036	1,430		1,430	3.8

A: no underground transactions, or no impact on estimates.

B: impact primarily from 'skimming' of business receipts.

C: significant impact due to underground transactions.

Appendix II

Potential understatement of personal expenditure due to underground transactions, by category, 1992

		Excluding taxes	Including taxes	Skimming	Other	Total potential understatement	
	Status	\$M	\$M	\$M	\$M	\$M	%
Non-durable goods:							
Food and non-alcoholic beverages	B	42,039	42,479	1,512	50	1,562	3.7
Imputed food (farm and non-farm)	A	936	936				
Motor fuels and lubricants	A	11,413	12,197				
Electricity	A	9,067	9,965				
Natural gas	A	2,715	2,923				
Other fuels	A	2,196	2,405				
Alcoholic beverages	C	9,561	11,089		1,283	1,283	11.6
Tobacco products	C	5,779	9,848		1,057	1,057	10.7
Pet food	B	805	911	57		57	6.3
Soaps and other cleaning supplies	B	1,831	2,070	65		65	3.1
Other household supplies	B	3,408	3,839	98		98	2.6
Flowers and plants	B	1,332	1,488	117		117	7.9
Cosmetics and toiletries	B	3,685	4,199	108		108	2.6
Drugs and pharmaceutical products	B	6,129	6,536	180		180	2.8
Sub-total, non-durable goods		100,896	110,885	2,137	2,390	4,527	4.1
Services:							
Gross imputed rent	A	59,258	59,258				
Water charges relating to imputed rent	A	1,103	1,103				
Gross paid rent	B	20,832	20,832		220	220	1.1
Water charges relating to paid rent	A	645	645				
Furniture and appliance rental	B	266	266				
Janitorial services	B	722	722				
Meals outside the home	B	17,461	19,497	2,188	146	2,334	11.7
Service portion of alcoholic beverages	C	3,176	3,589	399	682	1,081	30.1
Accommodation	B	2,463	2,755	293	7	300	10.9
Board paid	C	274	274		14	14	5.1
Travel payments	A	13,553	13,553				
Military pay and allowances abroad	A	310	310				
Less: Travel receipts	A	-8,059	-8,059				
Imputed lodging	A	553	553				
Lodging paid	C	701	705		35	35	5.0
Lodging in universities	A	251	251				
Laundry and dry cleaning	B	1,002	1,078	175		175	16.2
Domestic and household services	C	2,559	2,663	203	250	453	17.0
Child care	B	3,512	3,512	137		137	3.9
Property insurance, cost of service	A	284	376				
Medical care, dental care and the like	B	2,427	2,427		121	121	5.0
Special care facilities, operating expenses	A	3,588	3,588				
Other health care	A	2,887	2,887				
Hospital care and the like	A	2,443	2,443				
Accident and sickness insurance	A	987	1,116				
Bridge and highway tolls	A	101	101				
Automobile insurance, cost of service	A	1,876	1,958				
Parking	B	761	797	9		9	1.1
Driving lessons and tests	B	234	250	13		13	5.2
Motor vehicle renting and leasing	B	1,173	1,325	60		60	4.5
Commissions of tour operators	A	494	514				
Urban transit	A	1,276	1,276				

A: no underground transactions, or no impact on estimates.

B: impact primarily from 'skimming' of business receipts.

C: significant impact due to underground transactions.

Appendix II

Potential understatement of personal expenditure due to underground transactions, by category, 1992

		Excluding taxes	Including taxes	Skimming	Other	Total potential understatement	
	Status	\$M	\$M	\$M	\$M	\$M	%
Services - continued							
Railway transport	A	124	132				
Intercity and rural bus transport	A	512	536	5		5	0.9
Air transport	A	4,583	4,766				
Water transport	B	164	169	2		2	1.2
Taxis	B	307	327	30	5	35	10.7
Moving and storage	B	525	561	49		49	8.7
Telecommunications	A	5,539	6,311				
Postal service	A	490	526				
Lotteries	A	2,470	2,470				
Pari-mutuel betting	A	428	430				
Other recreational services	B	4,596	4,900	322		322	6.6
Cable television and pay television	A	2,072	2,338				
Movie theatres and drive-ins	B	383	410	18		18	4.4
Photography	B	679	763	79		79	10.4
Universities, operating expenses	A	9,021	9,021				
Private schools, operating expenses	A	2,350	2,350				
Other educational and cultural services	B	1,408	1,446	40		40	2.8
Hairstyling for men and women	B	2,168	2,311	373	37	410	17.7
Other personal care	B	530	568	106		106	18.7
Funerals and burials	B	743	796	89		89	11.2
Trust companies, imputed interest	A	988	988				
Stock and bond commissions	A	967	967				
Interest on consumer debt	A	5,872	5,872				
Credit unions, imputed interest	A	556	556				
Life insurance, cost of service	A	4,082	4,134				
Bank service charges paid	A	2,369	2,392				
Bank service charges imputed	A	3,602	3,602				
Credit unions, cost of service	A	373	377				
Pension funds, cost of service	A	581	581				
Mortgage loan companies, imputed interest	A	1,624	1,624				
Mutual funds, cost of service	A	1,521	1,627				
Legal, accounting and other services	B	1,733	1,855		87	87	4.7
Welfare organizations, operating expenses	A	4,162	4,162				
Religious organizations, operating expenses	A	3,139	3,139				
Trade unions, operating expenses	A	1,544	1,544				
Political parties, operating expenses	A	207	207				
Sub-total, services		211,525	217,323	4,590	1,604	6,194	2.9
Sub-Total, categories designated as A		181,339					
Personal expenditure on goods and services		393,053	419,536	10,836	3,994	14,830	3.5

A: no underground transactions, or no impact on estimates.

B: impact primarily from 'skimming' of business receipts.

C: significant impact due to underground transactions.

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